DOCUMENT RESUME

ED 339 583 RC 018 433

AUTHOR	Chi, Peter S. K.; And Others
TITLE	Research on Migrant Farmworkers in New York State.
INSTITUTION	State Univ. of New York, Ithaca. Coll. of Human Ecology at Cornell Univ.
SPONS AGENCY	Department of Agriculture, Washington, D.C.; Milbank Memorial Fund, New York, N. Y.
PUB DATE	Sep 91
NOTE	240p.; Some papers were presented at the National Conference on Migrant and Seasonal Farmworkers (Buffalo, NY, April 29-May 2, 1991). Several papers have been submitted to or published in professional journals.
PUB TYPE	Reports - Research/Technical (143) -- Collected Works - General (020)
EDRS PRICE	MF01/PC10 Plus Postage.
DESCRIPTORS	Agricultural Laborers; Drinking; Economic Opportunities; *Economic Status; *Health Conditions; Health Education; *Life Style; Literature Reviews; Mental Health; Migrant Health Services; *Migrant Housing; *Migrant Workers; Poverty; *Quality of Life; Research Methodology; Sociocultural Patterns
IDENTIFIERS	*New York

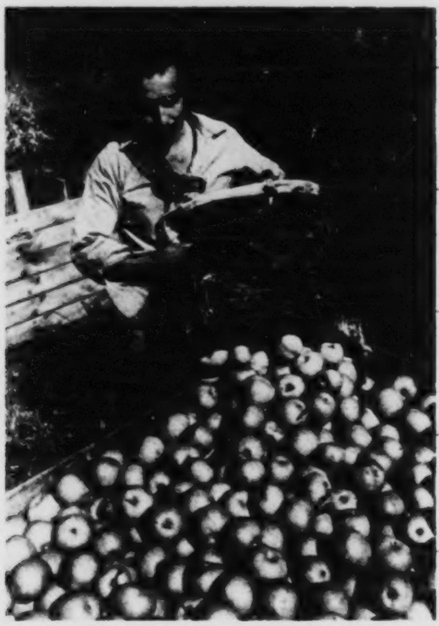
ABSTRACT

This monograph represents a collection of reports generated by a state-wide collaborative research project begun in 1982. The reports, based on information collected by a literature review and two surveys of representative samples of migrant workers in New York State, systematically analyze relationships between migrant workers' health conditions, general well-being, family life and their labor force productivity. The first section researches the background by reviewing the literature on migrant farmworkers and describing the sampling procedures. The second section, Health Status and Lifestyles, contains "Variation in Subjective Well-Being Among Black Migrant Farmworkers in New York State" and "Drinking, Farm and Camp Life: A Study of Drinking Behavior in Migrant Camps in New York State." The third section, Medical Utilization Patterns, includes "Medical Utilization Patterns of Migrant Farmworkers in Wayne County, New York" and "Health Characteristics and Utilization of Public Sector Health Facilities among Migrant Farmworkers in Orange County, New York." The fourth section, Housing Conditions and Economic Opportunities, includes four reports: (1) "A Tale of Two Homes: A Study of Housing Conditions of Migrant Farmworkers"; (2) "Migrant Farmworker Earnings: A Human Capital Approach"; (3) "Economic Rewards for Migrant Farmworkers"; (4) "The Economic Returns from Investment in Physical and Mental Health: A Case Study of Migrant Farmworkers in Rural New York"; and (5) "The Poverty Status of Migrant Farmworkers." (LP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED339583

RESEARCH ON MIGRANT FARMWORKERS IN NEW YORK STATE



U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Peter S. K. Chi

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Peter S. K. Chi

Shelley White-Means

Janet McClain

RC018433

Cornell Migrant Program

BEST COPY AVAILABLE

Department of Human Development and Family Studies
Cornell University, Ithaca, NY 14853

RESEARCH ON MIGRANT FARMWORKERS IN NEW YORK STATE

By

Peter S.K. Chi[1], Shelley White-Means[2], and Janet McClain[3]

[1] Professor, Department of Consumer Economics and Housing, College of Human Ecology, Cornell University, Ithaca, New York. 14853-4401

[2] Associate Professor, Department of Economics, Fogelman College of Business, Memphis State University, Memphis, Tennessee. 38152

[3] Assistant Professor, Department of Political Science, University of Western Ontario, Canada

Cornell Migrant Program, College of Human Ecology,
Cornell University, Ithaca, New York 14853

SEPTEMBER, 1991

Contents

Preface

Introduction

Research Background

Page

1. Literature Review on Migrant Farmworkers 1

Peter S.K. Chi, Shelley White-Means and Janet McClain

2. A Note on Sampling Migrant Farmworkers 35

Peter S.K. Chi

Health Status and Lifestyles

1. Variation in Subjective Well-Being Among Black Migrant Farmworkers in New York State 43

Peter S.K. Chi

2. Drinking, Farm and Camp Life: A Study of Drinking Behavior in Migrant Camps in New York State 66

Peter S.K. Chi and Janet McClain

Medical Utilization Patterns

1. Medical Utilization Patterns of Migrant Farmworkers in Wayne County, New York 87

Peter S.K. Chi

2. Health Characteristics and Utilization of Public Sector Health Facilities Among Migrant Farmworkers in Orange County, New York 108

Shelley White-Means

Housing Conditions and Economic Opportunities

Page

1. A Tale of Two Homes: A Study of Housing Conditions of Migrant Farmworkers 132

Peter S.K. Chi

2. Migrant Farmworker Earnings: A Human Capital Approach 158

Shelley White-Means

3. Economic Rewards for Migrant Farmworkers 174

Peter S.K. Chi

4. The Economic Returns From Investment in Physical and Mental Health: A Case Study of Migrant Farmworkers in Rural New York 192

Shelley White-Means

5. The Poverty Status of Migrant Farmworkers 207

Shelley White-Means

PREFACE

Agriculture is one of the important industries in New York State. It is also one of the most hazardous occupations in the United States and working conditions for farmworkers have improved very little over time. Farmworkers face unique problems due to a short growing season, the changing industrial structure of agriculture, competition with immigrant farmworkers and unpredictable demand for their services.

Since 1982, state-wide research conducted by Cornell University has thoroughly examined the general social status of migrant farmworkers and has systematically analyzed the links between migrant workers' health conditions, general well-being, family life and their labor force productivity. Our research is based on two empirical surveys of representative samples of migrant farmworkers in New York State. The first survey was conducted in Wayne County in the summer of 1982; the second, in Orange county in the summer and fall of 1986.

This monograph is a compendium of eight years of work by a number of different researchers representing a variety of disciplines and perspectives on farm work. All the articles (except the last one) included in this volume have been published in academic journals and/or presented at professional meetings. The material in this monograph covers a broad range of topics related to migrant farmworkers, from sampling techniques, literature review, access to medical care, health status and lifestyles to housing conditions and economic opportunities for a transitory population. Since our research has a strong empirical base and relevance for public policy, this volume may be of considerable interest to social researchers, health and human service professionals, extension agents, community development workers, and farmworker advocates as well as to state and federal legislators.

Many acknowledgements are due to the farmworkers, community service staff and local residents who gave their time and effort to ensure that this study was conducted. The study would not have taken place without the cooperation of the Cornell Migrant Program and the generous contributions of Kay Embrey, Extension Associate for Cornell Cooperative Extension in Wayne County. She assisted in identifying local fruit growers and service providers in the migrant farmworker community as well as making office space available to the staff of interviewers.

We are particularly grateful to the Wayne County fruit growers and Orange County onion growers, who recognized the importance of our study and helped us achieve our objectives. In addition, the local staff of Rural New York Inc. provided background information and advice on problems faced by farmworker families who worked in Wayne and Orange Counties. Staff members of the New York State Departments of Health and Labor were very cooperative in identifying registered migrant labor camps in these counties. The staff of local community health clinics were especially helpful in describing the history of publicly-assisted farmworker medical services, the main health problems identified by the clinic staff and the strengths and weaknesses of their services given funding and organizational constraints.

We also wish to thank Mr. Stash Grajwski, director of the "The Alamo," the Farmworkers Community Center in Orange County. He loaned us the facilities of the Center and his staff, and served as the liaison with local growers, packing house operators, crew leaders and farmworkers in the Goshen, Pine Island and Warwick areas of Orange County. It is also important to recognize the proprietors of the Willowbrook Inn in Warwick, New York, who provided our survey team with lodging and a comfortable place for review and assessment of each day's work.

This project could not have been carried out without the interest and dedication shown by the team of Cornell students who shared their knowledge and expertise with the project directors and who withstood the demands of travel and the long hours required to interview farmworkers. These students included Martha J. Link, who supervised the interviewer team of undergraduate students in Wayne County, Jeff Alwang, Maria-Ines Sanchez-Grinan, Eduardo Barrow, Julia Carrera, Michael Gertler, Luin Goldring, Carlos Indacochea, JoAnn Jaffe, Rigoberto Delgado, Ilana Mirtenbaum, Chil Mirtenbaum, Fernando Novella, Armando Perez, Lynn Roberts and Elena Pinto, who were the interviewer team in Orange County.

Special recognition must be extended to the translators of the survey instrument. Karin Holbreker worked on the Spanish version of the questionnaire and JoAnn Jaffee, with Michael Gertler, provided the Creole version. Thanks also to Patsy Sellen for the careful typing of this lengthy monograph. Finally, research fundings from the U.S. Department of Agriculture, Milbank Memorial Fund and Simithers Institute are deeply appreciated.

Joseph Laquatra, The 1982 Project Coordinator
Janet McClain, The 1986 Project Coordinator
Shelley White-Means, Co-Principal Investigator
Peter S.K. Chi, Co-Principal Investigator

INTRODUCTION

Gaining access to the population to be studied is often difficult for researchers. Securing useful data for program decision making is a problem for educational extension workers. These dilemmas can be ameliorated through collaboration between research and extension. The results of close cooperation are shown on the following pages.

Researchers Peter Chi, Shelley White-Means and Janet McClain became interested in the situation of migrant farmworkers in New York State, but they were located on the Cornell University Campus, a long way from the fruit and vegetable farms employing migrant farmworkers. By calling on the Cornell Cooperative Extension system, especially the Cornell Migrant Program, they were able to ease the process of gaining access to the farms and farmworkers. Cornell Cooperative Extension has an excellent reputation among growers and farmers, who were willing to help once they knew of Extension's support. The Cornell Migrant Program, represented especially by Kay Embrey and Kathy Fox, was familiar with the migrant labor camps and how to approach farmworkers to gain their cooperation. The Cornell Migrant Program was also able to provide background information on migrant farmworkers' racial and ethnic characteristics, patterns of work and travel, and language usage. The availability of health and social services for migrant farmworkers was known and shared by the Cornell Migrant Program.

Through collaboration, the research was conducted efficiently. The results are now being used for Extension program decisions. For example, one study proved that a substantial number of farmworkers return to the same area -even to the same farm- for many years; therefore, programs can be developed to serve the same migrant farmworkers over a long period of time. Another study demonstrated that good housing is positively related to farmworker productivity; therefore, farmers can be taught that investments in better housing can be mutually beneficial to the grower and farmworkers.

Public policy formation is another important use of good research data and we expect to see improvements in health, labor, housing and education based on the research of Chi, White-Means and McClain.

These studies have increased enormously the body of knowledge on migrant farmworkers in New York State. There is much yet to learn, and it is hoped that the joint efforts of research and Extension will continue for many years to come.

Herbert J. Engman
Director, Cornell Migrant Program

Research Background

Literature Review on Migrant Farmworkers

by

Peter S.K. Chi, Shelley I. White-Means and Janet McClain

Printed in R.E. Deacon and W.E. Huffman (eds.), Human Resources Research 1887-1987, Iowa State University, 1986.

Migratory farmworkers provide agricultural production and manufacturing with a labor supply at relatively low cost. This seasonal labor force has been affected by changes within the agricultural industry in the United States, but it remains a much needed element in the farm labor supply. Formerly noted for its reliance on intensive labor, the agricultural industry now depends on the use of machinery to plant, cultivate and harvest crops. By 1970, mechanization in agriculture had reduced the need for seasonal farm labor by approximately 30 percent (U.S. Department of Labor, 1971). At the same time, the increase in sales of produce directly to consumers and regional markets has tended to stabilize the demand for farm labor to harvest the numerous non-mechanized crops (U.S. Department of Commerce, 1983). Moreover, the pace of agricultural mechanization has slowed somewhat since the 1970s as a result of higher energy costs and the wide availability of labor (Glover, 1983). Therefore, the demand for migratory farmworkers in the agricultural industry can be expected to continue and research that will lead to improving their social and economic usefulness will most assuredly be necessary.

Before undertaking to specify directions for future research on migratory farmworkers, it is essential to examine the knowledge accumulated in previous research. Such a review is all the more useful at the present time because of the imminence of immigration reform. Along with stabilization of demand, the supply of farm labor has been greatly affected by immigration of foreign labor. U.S. immigration policies have, in the past, created the net effect of producing an oversupply of farm labor, which has directly and negatively affected the ability of migratory farmworkers to bargain collectively for fair wages and decent working conditions (Glover, 1983; Briggs, 1985). Many farms, especially those in the labor-intensive fruit and vegetable sectors, have long relied on successive waves of legal and illegal immigrants. Recent vivid debates in the U. S. Congress on immigration reform and control will certainly influence future immigration policy and foreign worker programs. Since illegal immigration is growing rapidly and the majority of Americans polled on the issue are in favor of controlling it, Congress will probably act on immigration legislation sometime in the near future. An examination of previous findings may provide a clue to the kind of legislation likely to be passed and will definitely be of value in assessing the potential impact of the new legislation on employers and migratory farmworkers.

This paper presents a national overview of significant research findings on migratory farmworkers over the past 50 or so years. Three specific criteria were used to select relevant research: first, research should be limited to migratory farmworkers (especially, interstate migrants and immigrants), with studies of local farmworkers excluded; second, research on migratory farmworkers should focus on a spectrum of issues related to their basic needs; and third, analyses of these interrelated issues should be based on broad perspectives. On the basis of these criteria, a general review framework was formulated, in terms of two major considerations: (1) What are basic life chances for migratory farmworkers? (2) What distinctive perspectives have been used to study migrant issues? Identification of basic life chances for migratory farmworkers defines their essential needs while the research perspectives adopted determines research strategies. In this paper, the basic needs of housing, health and economic earning opportunities have been identified as the fundamental life chances for migratory farmworkers. In research on different aspects of these life chances, analysis of the interrelated issues can be approached from both macro- and micro-perspectives.

The general framework is presented in Table 1, in which relevant research areas are identified within each cell. Two specific new lines of research can be generated from the framework. The first is research that attempts to link macro-policy issues to migrants' basic needs at the micro-level (as indicated in Table 1 by downward arrow lines). Along the second line, research may be undertaken to ascertain the interrelationships between various aspects of migrants' life chances (as indicated in Table 1 by horizontal arrow lines).

One of the purposes of this paper is to evaluate systematically some of the previous research on migratory farmworkers within the context of the general framework. The second purpose is to discuss the suggested promising directions for future research derived from the general framework. Findings from previous research will be reviewed in the next section. Section three will discuss future research directions and the final section will set forth the conclusions.

FINDINGS FROM PREVIOUS RESEARCH

General Characteristics of Migratory Farmworkers

Although migratory farmworkers are only a small proportion of the total hired farm work force in the United States (Smith and Coltrane, 1981), migrants can be distinguished not only by their greater mobility, which frequently involves crossing county and state lines, but also by their unique life style of seasonal residence in migrant housing. The popular image tends to depict migratory farmworkers as a large, homogeneous group of low-income workers, but empirical studies generally indicate that they are quite heterogeneous in their demographic and socioeconomic backgrounds and highly differentiated in their employment patterns (Pollack, 1981; Smith and Coltrane, 1981; and Whitener, 1985). For example, Pollack (1981) reported that only one-third of all migrants depended on hired farm work as their major employment in 1979. Another third were primarily engaged in non-farm occupations with farm work as supplementary employment, and the final third were students and others not in the labor force who worked on a farm only occasionally during the spring and summer months.

The majority of migratory farmworkers are intra-state white migrants. Most of the inter-state migrants and immigrants are blacks and Hispanics. Black inter-state migrants are largely centered in the Northeast migrant stream while in the West Coast and mid-continent streams, migratory farmworkers are predominately Hispanic (Metzler, 1955; Larson and Sharp, 1960; Sturt, 1966; Bauder, 1973; Slesinger, 1979; Martin, et al., 1985).

In most instances, migratory farmworkers are young, single men. In New York State, there seems to be a decreasing trend in the number of dependents working and an increase in the number of single men as a percentage of all migratory workers (Larson and Sharp, 1960; Chi, 1985). In Wisconsin, however, where about 91 percent of migratory farmworkers were Mexican, the majority were living in husband-wife families with children (Slesinger, 1979).

In general, migratory farmworkers tend to have a low level of education. Over time, as the general educational level has risen in the United States, the educational achievement of migrant workers has also improved. For instance, the median number of years completed in school was reported as 4.8 in a

1983 survey of migratory farmworkers in the Belle Glade area of Florida (Metzler, 1955). While in a recent New York State survey of migratory farmworkers (most of whom were from Florida), the mean number of years of school completed was 10.3. Most importantly, the educational level of native-born migrants was significantly higher than that of immigrants (10.3 vs. 7.6, respectively) (Chi, 1985).

Although migratory farmworkers are a highly mobile group, their seasonal mobility tends to follow a certain degree of regularity. For example, two different studies (Sharp and Larson, 1959; Slesinger, 1979) have consistently found that about one quarter of migrant workers had entered the migration stream for the first time. The Sharp and Larson study further reported that about 60 percent had been working for five years or less and 23 percent for ten or more years. A recent study (Chi, 1985) indicated that all migratory farmworkers (including some immigrants) in the sample had worked an average of 13.2 years as farmworkers, and long-term native-born migrants had also worked an average of 7.24 years for the same employer. These persistent working patterns suggest that migratory farmworkers are loyal workers in agriculture and should be considered an integral part of the receiving community rather than being treated as drifters.

Housing for Migratory Farmworkers

One of the most pressing problems confronting employers and migratory farmworkers is the lack of standard housing. Unlike the general population, the migrant needs adequate housing in two areas: at the home base and on the job (Brann, 1967). The latter type of housing is usually provided by the employer. It represents a long-term capital investment and becomes part of the farm operation. Most on-the-job housing is on farms where the migrants work; some is in off-farm camps sponsored by growers' associations, housing authorities and processing companies, and some migratory farmworkers rent their own housing in nearby areas. Housing units in the migrant camps are commonly one-room arrangements with central washing and toilet facilities in separate buildings.

The quality of on-the-job housing varies greatly from state to state. All major reports indicated that migratory farmworkers usually live in dilapidated structures that are cold and wet in winter and excessively hot in summer. Insufficient ventilation, unsanitary privies and bath facilities, inadequate storage and unhealthful methods of garbage disposal are often the prevailing conditions (U. S. Senate, 1969). In an effort to guarantee minimum standards in on-the-job housing, many states have established mandatory regulations applicable to migrant camps but the housing standards vary considerably from state to state. At least eight states require a license to operate a migrant camp, while Arizona, Connecticut and several other states have no such requirement in their codes. Penalties for noncompliance with the regulations also vary greatly, ranging from a $1000 fine or six-months imprisonment in Florida to a $200 fine or 60 days in jail in Nevada (Brann, 1967).

Employers' plans for housing improvement and new construction have been studied by some researchers (LeRoy et al., 1960; Conklin and McElroy, 1966). Several factors were found to influence employers' decisions on housing for their migratory farmworkers: availability and terms of credit, the outlook for crops and prices, possible changes in crops grown, cropping methods and their effects on labor needs.

Historically, housing in rural areas has been inferior to urban housing and the home-base housing of migratory farmworkers ranks the poorest of all housing for the rural population (Malotky, 1963). The most relevant federal housing program for migrants' home-base housing in the past has been self-help housing and home improvement. Technical assistance for this program was authorized under Title III-B of the Economic Opportunity Act of 1964 and loans were financed by the Farmer's Home Administration. This program had some significant impact on the areas in which it was successfully implemented (Brann, 1967).

In a recent study, Chi (1985) attempted to compare home-base and on-the-job housing for a representative sample of migratory farmworkers in New York State. It was found that home-base housing, on average, was more spacious and less crowded than on-the-job housing (mean number of rooms were 4.8 and 2.7, respectively). Further, a significantly higher proportion of on-the-job housing (58 percent, compared with 14 percent of home-base housing) had shared plumbing facilities (hot running water, flush toilet and bath). On the other hand, home-base housing units were more likely than on-the-job units to have major structural defects (e.g. leaking roof, or cracks and holes in the floors, interior walls or ceiling). The latter difference may be due to the fact that migrant camps in New York State are generally inspected bimonthly during the season of occupancy and at least once prior to occupancy; any structural defects found must be corrected before the employer is permitted to operate the camp.

Health Research on Migratory Farmworkers

Studies of migrant health care and health status can generally be classified into two types. The first type tends to center around providers of health services and comparisons of the relative quality, coverage, and costs of medical services between migrant clinics and private physicians (Chapman, 1964; Harkness and Dougherty, 1968; Rudd, 1975; Anderson and Kane, 1977). A general conclusion from these studies is that migrant clinics can provide more services for migratory farmworkers and meet more of their needs (particularly in preventive health care). However, the cost of such a program may exceed the cost of traditional curative care from individual private physicians.

The second type of study focuses on the medical utilization patterns of migratory farmworkers (Bleiweis et al., 1977; Slesinger and Cautley, 1981; Chi, 1985; White-Means, 1985). Bleiweis et al. 1977 reported from a study in Florida that the major factors affecting utilization of health services were presence of acute medical conditions (such as injuries) and perception of being in poor health. The researchers also collected frequent reports of a high incidence of alcohol consumption and concluded that this finding may explain the large number of digestive illnesses reported in the survey. In a study of Hispanic migrant farmworkers in Wisconsin, Slesinger and Cautley (1981) found that the use of health services by migratory farmworkers is generally low, compared with that of other populations. Older workers and women were more likely to make visits to physicians. Level of education was not related to use of health services, but language, distance, limited hours of services and inability to pay represented major barriers.

Based on a multiple regression model, Chi (1985) found that migrant status, Medicaid insurance and sex are the three significant variables to explain variations in visits to physicians among migratory farmworkers. His study also indicated that lack of time, economic costs, disbelief in the medical profession and lack of accessibility are major structural barriers that prevent many migrants from utilizing medical services. Using data from the same survey, White-Means (1985) has found, from a multivariate logit model, that the most significant factor influencing utilization of the community health center for those migrants who had known of its existence is the time price of health care. Time price as measured by either minutes of travel distance or travel minutes times wage earnings per minute is inversely related to utilization of a community health center. The health literature also indicates that many Hispanic Americans do not usually take a wide range of health problems to medical institutions but rather are treated by ritual healing specialists in culturally prescribed manners (Clark, 1959; Madsen, 1964; Rubel, 1966). The same phenomenon has been observed in a Hispanic migrant population (Slesinger and Richards, 1981).

In their study of migratory farmworkers in Wisconsin, Slesinger and Cautley (1981) reported that one out of every three workers perceived his/her health status as fair or poor. To extend the multidimensional concept of health status, Chi (1985) has attempted to measure migrant health status not only in terms of general perceptions of health but also according to physical, mental and social aspects of health. The Index of General Well-Being (GWB), developed by the National Center for Health Statistics, was adapted by Chi (1985) to access variation in mental health status among New York migratory farmworkers. Results from tests of both validity and reliability show that the GWB is fully as usable for migrant farmworkers as for the general population. The multivariate model indicates that variation in mental health status among migrant farmworkers is a function of life style, social support, housing conditions and three background variables--age, sex and education (Chi, 1985).

Studies of the relationships between alcoholism and occupational status indicate that the probability of problems related to drinking among migrant farmworkers is the highest of all occupational groups, even including unemployed persons (Marden, undated). In a questionnaire survey of 96 migrant health centers, 66 community mental health centers and 33 projects of the National Institute of Alcohol Abuse and Alcoholism located in migration streams, the President's commission on Mental Health found that alcoholism is viewed by 60 percent of the directors who responded to the questionnaire as the most significant health problem, followed by anxiety and depression (President's Commission on Mental Health, 1978).

Problems of alcohol consumption among migrant farmworkers have rarely been systematically examined. A 1983 study (Kunitz et al, 1983) conducted in two counties in Western New York State clearly indicates the need for research in this area. Drinking behavior was studied in 13 camps, using measures of quantity and frequency of consumption as key indicators of alcohol use. Consequences of alcohol use were measured by the Mulford scale (Mulford, 1964). The results indicate that alcohol consumption has increased among migrant farmworkers in Western New York. This study also reported that drinking was most frequent on weekends, during evening hours and on days when there was no work. The response was unanimous that migrant farmworkers did not drink on the job. Another study, on the development of alcoholism services for migrant farmworkers, has been conducted by Wlodarczk (1979), who has reviewed the employment and social conditions of hired agricultural workers and analyzed why these conditions may lead workers to alcohol consumption. This author did not conduct an empirical survey but did exam the development and organization of alcoholism services for the special treatment of migrant farmworkers.

The occupation of agricultural work is the third most hazardous in the nation, after mining and construction. Not only is work on the farm subject to a high incidence of accidents, but also the continuous exposure of workers to pesticides furnishes another serious health hazard. One report estimated that one-sixth of all California farmworkers were injured by pesticides each year (Gnaizda, 1970). A survey of 36 migrant camps in Wayne County, New York was conducted during August 1979 to determine whether camp location placed farmworkers at potential risk of pesticide exposure (Morse et al., 1982). The results showed that a significant number of migrants had potential pesticide exposure by living within spray areas. Unfortunately, exact health effects were not evaluated in this study.

At the macro-level, health policy issues have been explored by several researchers. Shenkin's comprehensive study (1974) focuses on the acceptability of health care and the problems of discrimination in service, causes of ill health, and problems of seasonal mobility and occupational health. Levels of health intervention and possible approaches are discussed both within the larger framework of migrant health policies and the reality of rural health systems. A dynamic model of nine sets of variables was developed to show the interaction between demand for and supply of health care and the causes of inadequate care. Johnston and Lindsay (1965) and Lindsay and Johnston (1966) discussed the role of the Migrant Health Act of 1962 in alleviating some of the health problems of migratory farmworkers and their families.

Economic Earning Opportunities for Migratory Farmworkers

The major themes in the literature on economic earning opportunities for migratory farmworkers are: employment and wage patterns, impacts of agricultural mechanization and effects of social and labor legislation.

The economic problems of migratory farmworkers generally arise from three sources: (1) they typically have less earning ability than other workers; (2) irregular and intermittent employment limits their earnings, and (3) they are generally unorganized and do not articulate their needs as well as more structured groups (Ducoff, 1947). As a result, migratory farmworkers are usually employed in the secondary labor market, in which jobs tend to be low paying and to have poor working conditions, few chances for advancement, and little employment stability (Fuller and Van Vuuren, 1972; Piore, 1975). However, a recent study (Whitener, 1985) shows that a degree of diversity and segmentation exists within this market. For example, inter-state migratory farmworkers (predominately blacks and Hispanics) are highly dependent on agriculture for their earnings and many have no other source of income, while intra-state migratory farmworkers (mostly whites) tend to depend on non-farm work as their primary activity. In an early study, Metzler (1950) also showed how the agricultural labor market in the San Joaquin Valley was segmented. Different ethnic groups from specific locations specialized in certain types of crops, and women and children performed different kinds of work than younger and older men.

Historically, most of the migratory farmworkers have been recruited directly by crew leaders for work crossing several states. Short distance workers were less likely to be members of a crew than longer distance workers (Metzler, 1955). Larson (1968) also provides some detail about the structure and organization of crews in Florida and other Southern states. Although crews vary in size and stability, the average crew had 29 workers in 1966. Small crews were often made up of family members and assembled in local Florida communities. Despite the presence of families, at least 50 percent of the crews were unattached individuals. In the 1957 research of Larson and Sharp, about 81 percent of migratory farmworkers in New York State were doing crop work in crews, but in 1982 less than 21 percent of sampled migrant workers in New York State relied on crew leaders to find farm jobs (Chi, 1986). This indicates a decline in the practice of recruiting in crews.

Two wage structures have been used in the American agricultural industry, hourly-rate (payment by time input) and piece-rate (payment by output). Piece-rate systems have been chosen in environments where employers find it costly to detect the performance of individual employees and employees as a result have an incentive to "waste" production time. It is thought that piece-rate systems increase the productivity of employees because they can perceive a direct link between their work efforts and their earnings. On the whole, most migratory farmworkers were paid a piece-rate, which varied widely among commodities, locations, and units of measure (Metzler, 1955; Larson, 1968; Martin et al., 1985). In California, Martin et al., (1985) found that most immigrant men were likely to have piece-rate jobs while most immigrant women and U. S. citizens had hourly-wage jobs. In New York State, on the other hand, male native-born migrant farmworkers were more likely than their female counterparts to be paid an hourly rate (21 percent vs. 7 percent respectively) (Chi, 1986).

In a multivariate model, Chi identified three significant variables in explaining variation in weekly wages among migratory farmworkers--sex, education and migrant status. More educated and male migrants tend to earn higher weekly wages than less educated and female migrant farmworkers. When other variables are statistically controlled, immigrants tend to earn more than native-born migrants. However, since native-born migrants have a significantly higher educational level than immigrants, the mean weekly wages for both groups are very similar.

Farm employers have historically provided hired farmworkers with a variety of perquisites, ranging from housing and transportation to garden lots. These fringe benefits have furnished non-cash income to many migratory farmworkers. In 1965, Dawson estimated that the perquisite value in selected counties of New Mexico would amount to about 25 to 30 percent of the worker's cash wage. In a recent study, Chi (1986) has found that employers tend to provide more fringe benefits to those migratory farmworkers who have worked for a longer period of time, are more productive and have higher scores on mental health status.

Of the literature on impacts of agricultural mechanization, emphasis has been placed on labor force readjustment (Larson and Sharp, 1960; Metzler, 1964; Zepp, undated; Martin and Johnson, 1978). It is commonly believed that technological change has a different effect on labor supply in the farm sector than in other industrial sectors. Fuller and Van Vuuren (1972) have eloquently argued that farm technology has the propensity to create underemployment rather than unemployment because of the self-employed share of the labor force. However, technology tends to depress the value of marginal product of farmworkers and thus displace many migratory farmworkers. Metzler's study (1964) documented the effects of mechanization on a migrant labor force. He points out that the year-round general farmworkers are becoming more specialized, such as in operating particular types of farm equipment or working in irrigation, and are the most adequately employed, while seasonal farmworkers are underemployed. Metzler considers that the greatest impediments to readjustment of displaced farmworkers in California are the status feelings and racial prejudices associated with some types of farm jobs. For instance, black workers were not able to move easily into other types of crops or into other farming regions and consequently found it very difficult to become proficient in other types of farm work.

In recent years, migratory farmworkers have been included under the provisions of some of the nonfarm labor and social legislation. Benefits such as minimum wage guarantees and unemployment compensation may be more crucial for this group than for other labor market segments, because other jobs are more secure (i.e. heavily unionized, technologically advanced and non-cyclically employed) and provide higher earnings. Martin and Johnson (1978) even propose that since farmworkers face a high probability of being displaced by farm mechanization, society should provide support for these workers during displacement. Mamer and Fuller (1978) present the counter-argument that protection of farmworkers through labor policy may, over time, benefit only some of the workers. Since non-wage benefits increase the employers' costs, employers may either attempt to selectively recruit only the most productive workers or to increase mechanization. Chiswick (1976) and Emerson (1973) examine the effect of unemployment compensation on agricultural markets. Chiswick hypothesizes that the availability of unemployment insurance will generate work disincentives during off-season periods. During the on-season, productivity tends to increase because workers realize that income during the off-season is positively correlated with on-season income. He found that employment during the off-season decreased by 5.5 percent and on-season employment increased by about one-half the reduction in off-season employment. His analysis represents a short-run prediction of the effects of unemployment compensation.

Emerson makes the observation that as workers take advantage of unemployment benefits, employer tax payments will increase to cover these benefits. Given the assumption that agricultural workers do not change migration patterns during on-seasons or unemployment during off-seasons, he estimated that the availability of unemployment insurance in agriculture would require an increase in taxes equivalent to 3-3.3 percent of agricultural earnings.

Minimum wage coverage is available to farmworkers employed on farms that use more than 500 man-days of labor in the peak calendar quarter. Gardner (1972) and Lianos (1972) examine the effect of this legislation on the employment of hired farm labor. Using national agriculture data, Gardner finds that extension of coverage to some farmworkers increased average farm wages by 13 percent and decreased average employment by 18 percent. These results are typical of a market where the elasticity of demand for low-wage farm labor is very high. Lianos, who examines the effect of minimum wages on employment of hired farmworkers in the Southern states, also reports a very high wage elasticity of demand for hired labor. In this study, the estimated wage elasticity was -1.1; thus, a 1 percent increase in farm wages leads to a 1.1 percent reduction in employment.

Both Chase (1967) and Emerson (1984) warn that caution should be taken in predicting the effects of minimum wages on the labor market. Chase reveals that federal regulations require that the farmer pay the minimum wage, not necessarily that the worker receive it. Many migrant workers are still contracted to the farmers through a crew leader. Thus farmers pay crew leaders for services provided by farmworkers and workers receive wage payments from crew leaders. Further, Emerson notes that minimum wage legislation typically establishes a wage based on an hourly pay rate. Since many migratory farmworkers are paid by piece-rate, the employer still has leverage in payment of earnings.

DIRECTIONS OF FUTURE RESEARCH

This section will discuss in detail the two major lines of research that may be generated from the general framework presented in Table 1. One line of research focuses on interrelationships between various aspects of migrants' basic needs (i.e. their life chances), and the other links these basic needs and various macro-policy issues. Although there has been extensive research which focuses on analysis of individual areas of migrants' basic needs (the micro level cells of Table 1), there has been limited assessment of either the interdependencies between basic needs or the role of macro policy as a stimulus for enhancing migrants' life chances. Research on nonmigratory populations is reviewed in this section and used as a means to develop hypotheses of directions for future research of migrant farmworkers. It is hoped that the formulations suggested by the research hypotheses may stimulate essential and more comprehensive undertakings in the future.

Interrelationships of Migrants' Basic Needs

Relationship between micro housing conditions and health status. The relationship between housing and environmental conditions and health status is an important area that unfortunately has been overlooked to some extent in current research. Health status and housing conditions are usually studied separately and recommendations with respect to improving housing quality and environmental conditions are usually made independently from recommendations with respect to health conditions and services. A few areas of concern illustrate the linkage between public health problems and housing conditions in migrant labor camps most clearly.

In Brann (1967) and Chi (1985), it was found that farmworker families and households are occupying housing originally intended for single (primarily male) workers. It is also known that temporary housing is occupied for longer periods than may be safely inhabitable depending on the length of the season, inclement weather or the lack of employment in the farmworkers' home communities. Longer term use of temporary housing units raises questions about the adequacy of this housing and the effects of crowding on sanitation and camp cooking facilities. Poor heating and ventilation often exist in camp housing and this has detrimental effects on health conditions if the harvest season extends further into the colder months in some areas.

Another problem related to camp housing conditions is that due to overcrowding, inadequate provision of units or, in some states, no housing provision, private arrangements are made. This housing is usually secured in local motels and hotels, camp grounds and mobile home parks, and in individual housing units which are often shared by large numbers of people. In addition, camps housing fewer than five people are usually not inspected by state health and labor departments. Little is known about these more informal housing arrangements and their potential health hazards.

A further problem linking health status and housing conditions is the proximity of farm labor camps to farming areas. Close proximity may result in contamination of housing due to aerial spraying and heavily used pesticides seeping into the water supply. The health and hazard effects of "chronic low level exposure to pesticides are relatively unknown but may include dermatitis and polyneuropathy" (Morse, et al., 1982). Better documentation is needed of the impact of living in close proximity to farming areas where there is heavy use of pesticides. In addition, if proper washing and laundry facilities are not provided then more extensive problems of contamination of housing and food preparation areas may exist than has been studied.

Relationship between health status and worker's productivity. Constant mobility, uncertainty, underemployment, poverty, isolation, poor health and high incidence of alcoholism not only characterize the migratory way of life but also reflect levels of human suffering that afflict a high proportion of migratory farmworkers, especially interstate migrants. From both humanitarian and economic viewpoints, migrants' existing conditions and their life chances deserve special attention. One important aspect of the migrant's life chances is his/her ability to compete for gainful employment in a tight labor market. Facing similar adversities, some migrant farmworkers may be more productive than others in their efforts for higher achievement. Variation in productivity among migratory farmworkers should be a major focus of future research. It is hypothesized that migrants' productivity is affected not only by such traditional human capital factors as formal education and work experience but also by their ability to react effectively to an adverse social, economic and political environment. This unusual ability to adjust to adverse conditions is hypothesized to be associated with a higher degree of health status.

Research that assesses the role of health status in influencing productivity addresses either the impact of variation in individual health status on individual productivity or the effect of variation in an aggregate measure of health status on national productivity. The health status measures used in individual/micro-level analysis include mental health/job satisfaction, physical health (proxied by health services utilization), or nutritional health (a composite proxy measure of physical and mental health). The health status measures in the macro analysis include disease rates and rates of mortality and morbidity. The following discussion examines only the micro-level analysis.

The literature is only suggestive of the causal link between the mental health status of migrant farmworkers and their productivity since most of the research in this area examines the causal link in "traditional" job settings (Graham, 1966; Martin, 1969; Slocum and Missauk, 1970). Only Foner and Napoli's work (1978) specifically addresses the productivity of migratory farmworkers.

Graham finds a positive relationship between job satisfaction and productivity. He indicates that job satisfaction is reflected by an individual's ability to satisfy a psychological need. Workers have maintenance needs (those which cause dissatisfaction and frustration if they are not fulfilled) and motivational needs (those associated with self actualization). Maintenance needs include wages, benefit packages, working conditions and supervisory support. Motivational needs include achievement, recognition, responsibility, growth and advancement.

Martin's research qualifies the hypothesis of a positive correlation between job satisfaction/morale and productivity. He finds that the productivity/job satisfaction relationship depends on the type of work performed. When productivity is either very high or very low, a positive correlation exists but this need not be the case when productivity is in the middle ranges. In an examination of worker productivity in a Pennsylvania steel plant, Slocum and Misshauk report similar results. Among highly skilled workers (engineers and technicians), job satisfaction and productivity were negatively correlated, while among low skilled workers (those involved in routine and repetitive tasks), the correlation was positive.

Foner and Napoli, in a comparative study of Jamaican and African American migrant farmworkers, find the former group to be relatively more productive. They note that Jamaicans place a higher value on wage payments for farm work than African Americans do. This higher value reflects the earnings differential between the United States and Jamaica. Whereas in the United States wages paid for farm work are relatively low. Jamaican farmworkers employed in the United States have high earnings relative to earnings in their home country. Where African American migrant farmworkers perceive farm work as "work of last resort," Foner and Napoli indicate that Jamaican workers have used farm work earnings to achieve independence and to facilitate movement to middle class status. Through a momentous attainment of both motivational and maintenance needs, Jamaican farmworkers have greater job satisfaction. Higher levels of productivity are thus generated.

Empirical research assessing the impact of nutritional status of migrant farmworkers on productivity does not exist. However, research by Hersch (1981) on piece-rate workers in a New York State clothing factory and research by Spurr (1983) facilitate generation of the hypothesis that nutritional status should be both positively and significantly correlated with migrant worker productivity.

Hersch defines productivity as the piece rate wage per hour. In essence, her productivity measure implicitly assumes that more productive workers should produce more pieces per hour. Thus, for some fixed earnings rate per piece produced, earnings per hour of more productive workers should be higher.

Nutritional status is measured by energy generated through caloric intake. She finds the energy elasticity of production to equal 0.222. Thus, if energy available for generating production income increases by 1 percent, productivity (earnings per hour) increases by 2.22 percent.

Spurr's research shows that iron deficiency and the anemia which results have detrimental effects on the maximum work capacity of adults. Iron deficiency reduces both the total hours one can work and the productivity per hour. Since minority populations have been documented to have an iron intake well below recommended daily allowances, we can hypothesize that this component of nutritional status has significant explanatory power in an evaluation of migrant worker productivity.

Grossman (1972) and Luft (1975) provide additional verification for the hypothesized positive relationship between health and productivity. Again the analysis is performed on a non-migratory farmworker sample. Grossman examines the relationship between use of medical services and work days lost, with the effects of education, age, sex and income per family member controlled. He finds the medical services elasticity of work loss days to equal -0.545; i.e., a 1 percent increase in use of health services will lead to a reduction of 5.45 percent in work days lost. Given that health status and medical care consumed are positively related and that an increase in work loss days decreases the ability to generate income, the above results imply that increases in physical health status will increase productivity levels of workers. The physical health levels of migrant farmworkers is relatively lower than that of the general population sampled by Grossman. Thus, utilization of a unit of medical services should have a relatively larger impact on the health levels of migrant workers.

Using both a white and black sample population, Luft tests the hypothesis that lack of perfect health (i.e., a person's health either prevents them from performing certain jobs or a person is limited in the kind and/or amount of work performed) should reduce the earnings potential of workers. He finds that "well" and "sick" black employees exhibit significant differences in weeks worked and earnings per year. Lack of perfect health leads to a reduction of 7.15 and 7.773 weeks worked for black men and women, respectively. In dollars of earnings this reduction represents a loss of $1010 and $481. Health thus is indeed directly and significantly related to the productive earnings potential of black workers. Similar results would be expected for the migrant population.

Macro Policy and Migrants' Basic Needs

Potential effects of housing policy on migrants' housing conditions. Rural housing assistance in the United States has primarily developed through the provision of credit for home ownership and loans and grants for home repair by the Farmers Home Administration. More recently, some special Department of Housing and Urban Development direct assistance programs have been used in nonmetropolitan areas meeting certain population requirements. On the whole, the provision of better housing for farmworkers has not been a major focus of rural housing assistance programs at the federal level.

Fundamental research assessing rural housing needs of migrant farmworkers is sorely lacking. In particular, further research efforts might include monitoring and surveys of migrants' rental housing stock (including mobile homes), studies of the effects of instability in local farm economies on living arrangements and settlement patterns of migrant workers and their dependents. Displacement of hired farmworkers is not a new phenomenon (Metzler, 1964) and this problem has not been adequately studied in relation to changing housing needs and conditions both at the local and state levels.

Because rural housing policy is not well developed, it is not surprising that the provision of on-the-job housing has not been taken up directly by any federal agency recently except under the Farmers Home Administration (FmHA), Sections 514 and 516 farm labor housing loans and grants programs. Some state housing agencies, such as in California, have developed new housing for migrant families using both state and federal funds. As of 1981, 1,583 units were provided directly using the FmHA farm labor loan and grants program. Some 1,517 units were also provided in rural areas using FmHA rural rental assistance under Section 515 (Hartman, 1983).

In 1982, the Congressional Budget Office issued a discussion paper about the long-term costs of FmHA rural housing programs. Of particular concern, was the interest credit arrangements under Section

515 loans and the need to raise the share of income to 30 percent paid by FmHA renters toward housing costs. Concern was also expressed about the subsidy cost of all interest reduction programs including those supporting the construction and improvement of farm labor housing. Further research should be done to specifically measure whether reductions of subsidy arrangements would discourage use of this program altogether.

Current housing policy is being developed with a greater emphasis on housing demand assistance -- rent supplements, housing allowance and voucher programs and home ownership assistance grants. These programs are developed with the assumption good quality housing is available in adequate supply in most communities and the main problem is housing cost. Generally, housing allowance and voucher programs assume there is more of a need for rent relief than for assistance in improving existing housing conditions or in providing alternative forms of housing. It is also assumed that over time, households with vouchers will improve the quality of their housing and their security of tenure. These assumptions are more applicable in urban housing markets which offer a wider range of choices in housing type, location and accommodation of needs than in rural and nonmetropolitan areas.

There are advantages and disadvantages to housing allowance and voucher programs which must be tested further both through actual trial programs and through further research on rural housing markets. For migrant workers who do not qualify for other forms of local housing assistance, housing vouchers not tied to particular residential locations would provide a clear advantage in some lower-income housing markets they could not enter otherwise.

Potential effects of health policy on migrants' health status. Heredity, environmental and working conditions, food intake and alcohol and drug use are factors which can be utilized to explain a farmworkers' existing health status. Federal health programs can be envisioned to function as external mechanisms which increase the ability of the farmworker to increase his life chances. It is hypothesized that effectively implemented health programs can induce changes in existing health levels and thus increase the farmworkers' ability to compete for gainful employment in a tight labor market.

In addition to utilizing federally funded migrant health clinics, farmworkers have availed themselves to other types of health-status-promoting social programs. Of these programs the most heavily utilized are food and nutrition programs, i.e., Food Stamps and the Special Supplemental Food Program for Women, Infants and Children (WIC).

Despite widespread use of Food Stamps by migrant farmworkers, there has been no research that examines the association between food stamp availability and farmworkers' nutritional health status. In 1972, Madden and Yoder compared the dietary adequacy, i.e. intake of energy, protein, calcium, phosphorous, iron, vitamins A and C, riboflavin, niacin and thiamin, of food stamp participants with an eligible group of nonparticipants in rural Pennsylvania. They found higher levels of dietary adequacy for the food stamp participants. Similarly, migrant farmworkers' nutritional health status may be expected to increase. The food stamp program essentially functions as an income supplement that allows the worker to increase both the quantity and quality (dietary adequacy) of food consumed. On the other hand, the results of the evaluation of the effectiveness of the program for migrant farmworkers may differ from that of other rural residents because farmworkers are mobile and may face greater restraints in the use of food preparation and storage facilities. Access to the food stamp program may also increase other components of farmworker health in that it allows the worker to take income formerly used for food purchases and to redistribute this income to the purchase of other necessities.

WIC programs for migrant farmworkers have in general been evaluated in regard to program structure and program ability to eliminate barriers to migrant participation (Development Associates, 1979). There has been very limited analysis of the program's effect on migrant health, although these results allude to health benefits from the program. When a WIC program was implemented at the Migrant Health Center at Orange Grove, California, it was noted that there was a two-thirds reduction in clinic visits among 34 children that had utilized the clinic both before and after the program implementation (Porteus, 1977). These reductions in visits were attributed to a decline in treatments for respiratory illnesses probably caused by malnutrition. Further research in this area is direly needed.

Research on alcoholism services for migrant farmworkers has also focused predominantly on the inadequacies of alcoholism services provided by agencies for whom the majority of the clientele is neither farmworker nor migratory (Wlodarczyk, 1979). This research has emphasized that special efforts need to be made to address (a) integration of alcoholism counseling services with primary health care diagnostic and treatment centers established for migrant workers, (b) outreach to farmworkers in camps that are significantly distanced from "traditional" treatment centers, and (c) the necessity for counselors to acquire knowledge of both the languages spoken by farmworkers and the role of working conditions in influencing alcohol consumption. Thus the research focuses on mechanisms for increasing the farmworkers access to treatment.

There is no empirical research that assesses the effects of migrants' utilization of alcohol counseling and treatment services. There is some indication in the general literature on alcoholism services (U. S. Department of Health and Human Services, 1981) that alcohol treatment services received in early or middle stages of the disease have a higher probability of influencing use than treatment administered to late-stage alcoholics. Furthermore, socioeconomic status and social stability can limit the effectiveness of treatment services. Baekeland (1977) found that while alcoholics of high socioeconomic status and high social stability had improvement rates of 32.4 percent to 68 percent, alcoholics of low socioeconomic status and low social stability had improvement rates of less than 18 percent.

Patton (1979) has even shown that when alcohol treatment programs lead patients to decide to abstain from alcohol consumption, these patients report significant improvements in their self-image, job performance and physical health. These findings suggest that careful consideration be given to each of the following when evaluating effects of alcohol treatment and counseling services on migrants' alcohol use, physical and mental health: the number of years the worker has been in the migratory work force, the farmworkers' earnings opportunities and the availability of social support services.

Potential effects of new immigration policy on the domestic labor market. The 1986 Immigration Reform and Control Act would penalize employers for hiring illegal immigrant workers, would make some illegal aliens legal residents, and would establish a modified foreign worker program for agriculture.

Empirical research on the potential effects of this immigration policy on the domestic labor market is needed not only for legislators but also for employers and workers as well. Coltrane's work (1984) only partially meets this need. Because of the absence of adequate data, Coltrane can only analyze farm labor expenditures by location and commodity in order to determine indirectly what types of farms and areas might be affected by the new legislation.

A well accepted argument in the literature is that immigrant labor changes the composition of the employed labor force. It is believed that immigrant labor either completely displaces American labor or provides the labor that Americans will not supply. The true effect of immigration may indeed lie somewhere between these extremes. To determine the impact of immigrant labor on the composition of the labor force within the market in which immigrants are hired, as well as the impact of immigrant labor on the entire domestic labor market, information is needed regarding the substitutability of domestic labor for immigrant labor.

Grossman (1982) attempts to measure this substitutability empirically. His estimates are based on data from the 1969 Census for nineteen SMSAs and includes workers in both blue- and white-collar occupations. He divides his sample population into native workers, second-generation workers and immigrants. Grossman finds that second-generation and immigrant workers are substitutes for native labor, although the former is a better substitute. Capital is complementary to all labor but is most strongly complementary to foreign-born workers. Grossman then extends this analysis to examine the effect of a 10 percent increase in number of immigrants on native and second-generation employment. He finds that, when no minimum wage law exists, the market effect of increased immigrant labor is limited to changes in the wages of labor. All labor wages decline; the largest decline is in wages of immigrant laborers. On the other hand, when a minimum wage law is in effect, a 10 percent increase in immigration leads to a reduction in employment among native and second-generation workers of one and 0.4 percent, respectively. As firms substitute cheaper labor, wages of immigrants rise slightly (0.2 percent). Thus, Grossman concludes, moderate increases in immigration do not cause "serious economic threats" to native workers.

Although no similar research has been applied to an assessing substitutability of immigrants for domestic farmworkers, Chi's (1986) analysis of determinants of wages and fringe benefits indicates that provision of amnesty for a large number of illegal immigrant workers and establishment of a modified foreign worker program could have the following effects on domestic migratory farmworkers: (a) more migratory farmworkers would be paid at piece rates than at hourly rates; (b) increasing competition for seasonal employment in agriculture would set a limit on available full-time job opportunities, and could pressure a reduction in wage rates even below the legal minimum level (because no legal piece rates are specified); (c) some part-time female migrant farmworkers could be replaced by more productive full-time male workers; (d) the number of free fringe benefits would be reduced if the supply of immigrant farmworkers is highly elastic.

The total effect of immigrants on the labor market depends not only on their direct impact on the labor market in which they are hired, but also on their indirect effect on other labor markets. Employed immigrants pay taxes and spend money on American-produced commodities. Thus, they serve to increase the demand for other commodities produced by workers who are not direct substitutes for immigrant labor. This results in increased productivity and higher wages for some native workers. This positive effect of immigrants assumes that they do not consume more in social services than their incomes and tax payments. Some evidence regarding this latter concern tends to support the assumption. Simon (1982) reports that immigrants are typically young, strong and single. Since they would tend to be in families with more children than retirees, they would transfer more to the economy in social security payments than they would consume in public expenditures on children plus transfers to retirees. Rochin (1978) cites a 1975 study of illegal immigrants in San Diego which documents that illegal immigrants used approximately $2 million in government services in contrast to the $49 million they paid in taxes on locally-earned wages.

CONCLUSION

Substantial amounts of research knowledge on migratory farmworkers have been accumulated during the past 50 years. Many of these studies were funded by various experiment stations in the United

States. Research methods used in these studies have evolved from journalistic descriptions of migrant life and participant observation of migrant families to multi-stage probability sampling of a large number of migrant farmworkers (Okada et al., 1982; Chi, 1985). We are now more capable of researching this highly transitory population than ever before.

The new directions for future research suggested in this paper involve a wide range of issues and a broad spectrum of perspectives; small, localized studies will not provide an adequate data base for a comprehensive, integrated analysis. Comparative regional studies focusing on common research issues and using a longitudinal data base are definitely needed. The Agricultural Experiment Stations will no doubt play a leadership role in this research endeavor.

REFERENCES

Anderson, W. W. and R. I. Kane. (1977). "Patterns of Care Given Migrant Workers in Utah by Private Physicians and Clinics," Public Health Reports 92(4), 326-331.

Baekeland, F. (1977). "Evaluation of Treatment Methods in Chronic Alcoholism." In: Kissin, B. and Begleiter, H. eds. The Biology of Alcoholism Vol. 6 Treatment and Rehabilitation of the Chronic Alcoholic, New York: Plenum.

Bauder, W. W. (1973, January-March). "Minority Workers on New York Farms," New York's Food and Life Sciences Quarterly, pp. 16-19.

Bleiweis, P. R., R. C. Reynolds, L. D. Cohen and N. A. Butler. (1977). "Health Care Characteristics of Migrant Agricultural Workers in Three North Florida Counties," Journal of Community Health 3(1), pp. 32-43.

Brann, R. R. (1967). "Housing of Migrant Agricultural Workers," Texas Law Review. 46:933-949.

Briggs, V. M. Jr. (1985). "Employment Trends and Contemporary Immigration Policy," Clamor at Gates: The New American Immigration, ed. N. Glazer, pp. 135-160. San Francisco: ICS Press.

Chapman, A. I. (1964). "Migrant Health Project in Pennsylvania, 1963," Public Health Reports. 79:561-566.

Chase, J. B. (1967). "The Migrant Farm Worker in Colorado--The Life and the Law." University of Colorado Law Review. 40:45-78.

Chi, P. S. K. (1985, May). "A Note on Sampling Migrant Farm Workers," The Rural Sociologist, 5(3), 158-162.

_______. (1985). "A Tale of Two Homes: A Study of Housing Conditions of Migrant Farmworkers," Department of Consumer Economics and Housing, Cornell University.

_______. (1985, August). "Conceptualization and Measurement of Health Status for Migrant Farmworkers," paper presented at the annual meeting of Rural Sociological Society, Blacksburg, Virginia.

______. (1986, August). "Employment and Economic Profiles of Migrant Farm Workers and Implication for Future Immigration Policy," presented at the annual meeting of Rural Sociological Society, Salt Lake City.

______. (1985, September-October). "Medical Utilization Patterns of Migrant Farm Workers in Wayne County, New York." Public Health Reports, 100(5), 480-490.

______. (1985, June). "Variation in Mental Health Status Among Black Migrant Farm Workers in New York," paper presented at the annual meeting of the American Association of Rural Health, Chicago, IL.

Chiswick, B. (1976). "The Effect of Unemployment Compensation on a Seasonal Industry: Agriculture." Journal of Political Economy 84(3), 591-602.

Clark, M. (1959). Health in the Mexican-American Culture, Berkeley: University of California Press.

Coltrane, R. (1984). Immigration Reform and Agricultural Labor, Washington, DC: U. S. Government Printing Office, Agricultural Economic Report No. 510.

Conklin, M. J. and R. C. McElroy. (1966). A Survey of Migrant Farmworker Housing in Oregon, Agricultural Experiment Station. Bulletin No. 602, Oregon State University.

Dawson, G. R. (1965). "Value of Perquisite for Hired Domestic Farm Labor," New Mexico State University, Agricultural Experimental Station Research Report 102.

Development Associates. (1979). Evaluation of the WIC Migrant Demonstration Project: A Final Report, Washington, D.C., U. S. Department of Agriculture, Food and Nutrition Service.

Ducoff, L. J. (1947). "Migratory Farm Workers in the United States," Journal of Farm Economics. 29:711-722.

Emerson, R. D. (1973). Migration and the Cost of Unemployment Insurance Protection for Agricultural Workers. Florida Agricultural Experiment Station. Bulletin No. 760, University of Florida.

______. ed. (1984). Seasonal Agricultural Labor Markets in the United States. Iowa: The Iowa State University Press.

Foner, N. and R. Napoli. (1978). "Jamaican and Black-American Migrant Farm Workers: A Comparative Analysis," Social Problems. 25:491-503.

Fuller, V. and W. Van Vuuren. (1972). "Farm Labor and Labor Market," Size, Structure and Future of Farms ed. A. G. Ball and E. O. Heady. Ames, Iowa: The Iowa State University Press.

Gardner, B. (1972, August). "Minimum Wages and the Farm Labor Market," American Journal of Agricultural Economics, pp. 473-476.

Glover, R. W. (1983). "Immigration and Agricultural Labor Policies" Increasing Understanding of Public Programs and Policies-1983, pp. 144-155, Oak Brook, IL.: Farm Foundation.

Gnaizda, R. Testimony before the Senate Sub-committee on Migratory Labor, April 15, 1970. Printed in "Migrant and Seasonal Farm Worker Powerlessness, Part 7-B," p.4697.

Graham, G. (1966). "Job Satisfaction," Personnel Journal. 45:544-547.

Grossman, J. (1982, November), "The Substitutability of Natives and Immigrants in Production," Review of Economics and Statistics 64(4), 596-603.

Grossman, M. (1972). The Demand for Health: A Theoretical and Empirical Investigation. New York: National Bureau of Economic Research.

Harkness, J. P. and W. J. Dougherty. (1968). "A Summer Health Project Organized and Conducted by Medical Students," Industrial Medical Surgery. 37:433-437.

Hartman, C. (ed.). (1983). America's Housing Crisis: What Is to Be Done? The Institute for Policy Studies, Boston: Routledge and Kegan Paul.

Hersch, J. L. (1981). "Allocation of Time and Human Energy and Its Effects on Productivity: Empirical Evidence From Piece Rate Workers." Ph.D. thesis, Northwestern University.

Johnston, H. L. and J. R. Lindsay. (1965). "Meeting the Health Needs of the Migrant Worker," Hospitals 39(14), 78-82.

Kunitz, S., R. Lynch and R. Morales. (1983). Alcohol Use Among Migrant Laborers, Albany, N.Y.: New York State Health Research Council.

Larson, O. F. (1968). "Migratory Agricultural Workers in Eastern Seaboard States," Rural Poverty in the United States, Washington, D.C.: U. S. Government Printing Office.

Larson, O. and E. F. Sharp. (1960). Migratory Farm Workers in the Atlantic Coast Stream I. Changes in New York, 1953 and 1957, Ithaca, N.Y.: Cornell University Agricultural Experiment Station, Bulletin 948.

LeRoy, N. L., E. F. Sharp and O. F. Larson. (1960). Migratory Farm Workers in the Atlantic Coast Stream VII. Housing and Technology Ithaca, N.Y.: Cornell University Agricultural Experiment Station.

Lianos, T. (1972, August) "Impact of Minimum Wages Upon the Level and Composition of Agricultural Employment." American Journal of Agricultural Economics, 477-484.

Lindsay, J. R. and H. L. Johnston. (1966, January) "The Health of the Migrant Worker," Journal of Occupational Medicine. 8(1), 27-30.

Luft, H. (1975, February). "The Impact of Poor Health on Earnings." Review of Economics and Statistics. 57, 43-57.

Madden, J. L. and M. D. Yoder. (1972). Program Evaluation: Food Stamps and Commodity Distribution in Rural Areas of Central Pennsylvania. University Park, PA: Agricultural Experiment Station.

Madsen, W. (1964). Mexican Americans of South Texas. Chicago: Holt, Rinehart and Winston.

Malotky, M. (1963). "Better Housing in the Country," in A Place to Live, The Yearbook of Agriculture 185.

Mamer, J. and V. Fuller. (1978, November). "Employment on California Farms." California Agriculture, 10-12.

Marden, Parker G. A Procedure for Estimating the Potential Clientele for Alcoholism Service Programs, Rockville, Maryland: Division of Special Treatment and Rehabilitation, National Institute of Alcohol Abuse and Alcoholism, undated.

Martin, A. (1969, January). "Morale and Productivity: A Review of the Literature." Public Personnel Review, 30, 42-45.

Martin, P. L. and S. S. Johnson. (1978, June). "Agricultural Mechanization and Public Policy," California Agriculture, pp. 4-6.

Martin, P., R. Mines and A. Diaz. (1985, May-June). "A Profile of California Farmworkers," California Agriculture, pp. 16-18.

McClain, J. (1985). "Remaining on Target: The Evolution of the Experimental Housing Allowance Program and Future Policy Development Considerations," (unpublished paper), Cornell University.

Metzler, W. H. (1950). "The Agricultural Labor Force in the San Joaquin Valley, California: Characteristics, Employment and Mobility," Washington, D.C.: U.S. Department of Agriculture, Bureau of Agricultural Economics.

______. (1955). "A Study in the Belle Glade Area of Florida," Migratory Farm Workers in the Atlantic Coast Stream, Washington, D.C.: U.S. Department of Agriculture, Circular No. 966.

______. (1964). "The Farm Worker in a Changing Agriculture," Part I, Series on Technological Change and Farm Labor Use, Kern County, Calif.: Giannini Foundation Research Report No. 277.

Morse, D. L., R. McLellan and C. Christophersen. (1982). "Potential Pesticide Exposure of Migrant Farmworkers Living Within Spray Areas," Journal of Environmental Health 44(6), 301-304.

Mulford, H. A. (1964). "Drinking and Deviant Drinking," Quarterly Journal of Studies on Alcohol, 25(1), 634-650.

Okada, Y., M. Richards and D. P. Slesinger. (1982). "Migrant Worker Studies: A Critical Review of Methodologies," Center for Demography and Ecology, University of Wisconsin, Madison. Working paper No. 82-33.

Patton, M. (1979). Validity and Reliability of Hazelden Treatment Followup Data. Center City, Minn: Hazelden Educational Services.

Piore, M. J. (1975). "Notes for a Theory of Labor Market Stratification," Labor Market Segmentation ed. R. Edwards, M. Reich and D. M. Gordon, pp. 125-50. Lexington, Mass. Heath.

Pollack, S. et al. (1981). The Hired Farm Working Force. U. S. Department of Agriculture, Economic Research Service.

Porteus, S. M. (1977). A State of the Field Study of Child Welfare Services for Migrant Workers and Their Families Who Are In Stream, Home Based or Settled Out: Literature Review. Interamerica Research Associates, Washington, D.C.

The President's Commission on Mental Health. (1978). Task Panel Reports: Migrant and Seasonal Farmworkers, Washington, D.C.: U. S. Department of Commerce, National Technical Information Service (PB-279816), pp. 1212.

Rochin, R. (1978, August). "Farm Mechanization Research: Assessing the Consequences." California Agriculture, pp. 8-10.

Rubel, A. J. (1966). Across the Tracks: Mexican Americans in a Texas City, Austin: University of Texas Press.

Rudd, P. (1975). "The United Farm Workers Clinic in Delano, Calif: A Study of the Rural Poor," Public Health Reports. 90:331-339.

Sharp, E. F. and O. F. Larson. (1959). Migratory Farm Workers in the Atlantic Coast Stream: V. New York, 1959, Ithaca, N.Y.: Cornell University Agricultural Experiment Station.

Shenkin, B. N. (1974). Health Care for Migrant Workers: Policies and Politics, Cambridge, Mass.: Ballinger Publishing Company.

Simon, J. (1982). "The Overall Effect of Immigrants on Natives' Income," The Gateway: U.S. Immigration Issues and Policies, ed. B. Chiswick, pp. 314-338.

Slesinger, D. P. (1979, June). "Migrant Agricultural Workers in Wisconsin," Population Notes 8.

Slesinger, D. P. and E. Cautley. (1981). "Medical Utilization Patterns of Hispanic Migrant Farmworkers in Wisconsin, "Public Health Reports 96(3):255-263.

Slesinger, D. P. and M. Richards. (1981). "Folk and Clinical Medical Utilization Patterns Among Mexicano Migrant Farmworkers," Hispanic Journal of Behavioral Science. 3(1):59-73.

Slocum, J. and M. Misshauk. (1970, March/April) "Job Satisfaction and Productivity." Personnel Administration, 33, pp. 52-58.

Smith, L. W. and R. Coltrane. (1981). Hired Farmworkers: Background and Trends for the Eighties, Washington, D.C.: U. S. Department of Agriculture, Rural Development Research Report. No. 32.

Spurr, G. B. (1983). "Nutritional Status and Physical Work Capacity." Yearbook of Physical Anthropology. 26: 1-35.

Sturt, D. W. (1966). "Farm Labor in 1980," in Project '80 - Rural Michigan Now and in 1980, pp. 9-14. East Lansing, Michigan: Michigan State University, Agricultural Experiment Station Bulletin 48.

U. S. Congress, Congressional Budget Office. (1982). Rural Housing Programs: Long-term Costs and Their Treatment in the Federal Budget, Washington, D.C.: U.S. Government Printing Office.

The U. S. Department of Commerce, (Bureau of Census). (1983). 1982 Census of Agriculture: Preliminary Report, Washington, D.C.: U. S. Government Printing Office.

U. S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration, National Institute on Alcohol Abuse and Alcoholism. (1981, January). "Fourth Special Report to the U. S. Congress on Alcohol and Health, Rockville, Maryland.

The U. S. Department of Labor (1971). Rural Manpower Developments: Outlook for Seasonal Farm Labor in 1971, Washington, D.C.: U. S. Government Printing Office.

The U. S. Senate (1969). "The Migratory Farm Labor Problems in the United States," 1969 Report of the Committee on Labor and Public Welfare, United States Senate, Sub-Committee on Migratory Labor pp.4-5, Washington, D. C.:U. S. Government Printing Office.

White-Means, S. I. (1985, June). "Knowledge and Demand for Subsidized Care Among the Rural Poor: With Special Emphasis on Role of Time," paper presented at the annual meeting of the American Association of Rural Health, Chicago.

Whitener, L. A. (1985). "The Migrant Farm Work Force: Differences in Attachment to Farmwork," Rural Sociology 50(2):163-180.

Wlodarczyk, P. A. (1979). Alcoholism Services for Migrant and Seasonal Farmworkers Master's Thesis, New Haven, Conn.: Public Health School, Yale University.

Zepp, G. A. (undated) "Effects of Harvest Mechanization on the Demand for Labor in the Florida Sugarcane Industry." Economic Report 72, Food and Resource Economic Dept., Agricultural Experiment Station, Institute of Food and Agricultural Sciences, University of Florida, Gainsville.

Table 1: A General Framework for Research on Migrant Farmworkers

	Life Chances for Migrant Farmworkers		
Perspectives	Housing	Health	Economic Earnings Opportunities
Macro-	(1) Subsidies on construction of standard migrant camps	(1) Health-care policy	(1) Immigration policy
	(2) Subsidies through housing voucher programs	(2) Nutrition and food policy	(2) labor policy: minimum wages and labor protection
		(3) Alcohol and drug programs	
Micro-	(1) Housing conditions in migrant camps	(1) Utilization of health services	(1) Wage level and pay structure
	(2) Migrants housing conditions in home communities	(2) Health status	(2) Productivity
		(3) Nutrition status	(3) Labor management
		(4) Alcohol and drug use	

"A Note on Sampling Migrant Farmworkers"

By

Peter S.K. Chi*

Printed in The Rural Sociologist, 5(3), 1985.

Since migrant farmworkers are highly transitory, collecting health statistics and related information from a representative sample of this population is a complicated task. Researchers (Rice et al., 1980; Salber and Bez, 1980) have noted the difficulty of obtaining data on migrant farmworkers through the National Health Interview Survey because of its sample design and the need for interviewees to live in established households. These researchers suggest that in-depth local surveys are the appropriate approach to collecting health data on seasonal migrant populations. This paper reports a special procedure through which health data can be obtained from a representative sample of migrant farmworkers. The procedure was developed for the New York Migrant Health Interview Survey conducted in Wayne County during the summer of 1982. Since the largest concentration of migratory agricultural workers in New York State is in Wayne County, it is an ideal research site for surveying migrant health conditions.

The sampled population for this study is defined as migrant farmworkers in Wayne County. A three-stage, stratified, random sampling technique was used. The primary sampling units were migrant camps and other migrant housing units; the ultimate sampling units were individual migrants. The detailed sampling procedure used in the present study consisted of seven steps (Table 1).

Step 1. The first step was to compile a comprehensive list of migrant housing units in Wayne County. Addresses for all migrant camps having a capacity of five or more persons were available from the New York State Department of Health since state law requires registration of such camps. Addresses of other migrant housing units in the county were obtained from county extension agents, migrant children census enumerators, and otherworkers in local agencies who were familiar with the migrant population. Within reasonable limits of confidence, the compiled list could be expected to include all migrant housing units in the county.

Step 2. All migrant camps and other migrant housing units (a total of 161 in Wayne County in 1982) were first stratified according to the size of maximum capacity. It is a known fact that most migrant families tend to live in small migrant camps or in individual housing units, whereas large migrant camps usually accommodate migrants who come to work alone (most of whom are immigrants or unmarried

Table 1. Sampling procedure.

Size category	(1) Camps or housing units[a]	(2) Migrants that could be accommodated	(3) Migrants expected to be sampled (2)x10%	(4) Camps or housing units selected for the sample	(5) Migrants actually sampled	(6) Total migrants on 10/21/82	(7) Weighting factor (6)/(5)	(8) Weighted sample (5)x(7)	(9) Derived population (8)/ sampling proportion[b]
1-5	46	173	17	12	7 (0.0321)	191 (0.0987)	3.0751	21	191
6-10	26	223	22	6	10 (0.0459)	218 (0.1127)	2.4569	25	218
11-15	38	515	52	8	50 (0.2294)	408 (0.2110)	0.9196	46	408
16-20	20	364	36	4	38 (0.1743)	267 (0.1381)	0.7919	30	267
21-25	11	253	25	2	23 (0.1056)	194 (0.1003)	0.9506	22	194
26-30	5	142	14	1	18 (0.0826)	117 (0.0605)	0.7326	13	117
31-35	7	232	23	2	41 (0.1880)	164 (0.0848)	0.4508	18	164
39-40	3	113	11	1	22 (0.1009)	91 (0.0471)	0.4662	10	91
41-140	5	400	40	2	9 (0.0413)	289 (0.1541)	3.6189	33	289
Totals	161	2,415	240	38	218 (1.0000)	1,939 (1.0000)		218	1,939

[a] Camps have more than five living units; other housing units have five or fewer.

[b] The sampling proportion was 218/1,939 or 0.112.

young migrants). Therefore, stratification of migrant living units by size of maximum capacity controls the household characteristics of different types of migrants.

Step 3. Since the research budget was set up for about 250 interviews, the preliminary sample size was determined as 10% of the maximum number of migrants in each size category.

Step 4. Since drawing a 10% random sample from all camps and housing units in each size category was not economically feasible, a three-stage sampling procedure was followed. In the first stage, a partial sample of migrant camps and housing units was randomly selected from each size category. The selection was based on two assumptions--that the average size was the midpoint of each size category and that at least 50% of the units in each size group were currently occupied.

Step 5. In the second stage of the sampling procedure, up to 50% of the housing units were randomly selected from each of the sampled camps and other housing units. If the occupancy rate was less than 50%, all occupied units in the sampled camps and other housing units were included in the survey. Since the migrant farmworkers living in these selected units were the ultimate sampling units, the household head or a working adult member of the randomly selected household was the interview subject. For a single-person household, that person was interviewed and the final selection was not necessary. The distribution of actually interviewed migrants was not necessarily identical to that of the expected number because each of the migrant camps had a different occupancy rate.

Step 6. Since October is the peak month for arrival of seasonal migrant workers, special efforts were made on October 21 of 1982 to find out from owners of migrant camps and other housing units how many migrants were actually living in the units. The total of 1,939 represented the total adult migrant population in Wayne County on that day.

Step 7. The actual sample size was finally calculated as 11.24% of the total number of migrants (218/1,939 x 100). Interviews were conducted between early July and early November, starting at the small housing units and ending at the large camps. Since levels of occupancy were lower at the beginning and end of the season, we undersampled at both ends and oversampled in the middle. In order to adjust for this sampling bias, we computed a ratio between proportions of total migrants and sampled migrants in each size category. In Wayne County, for example, while 11.27% of the total number of adult migrants actually lived in units in the size category 6-10, we selected only 4.59% from that category. Consequently, a weighting factor of 2.4569 (0.1124/0.0459) was applied in the statistical analysis to correct for our undersampling.

The procedure used in our work can be improved in future studies, of course. First, the total population of 1,939 adult migrants that was enumerated in October of 1982 was not cumulative. Therefore, some migrants who arrived for the cherry season and then left or others who came and went would not have been included. Second, the total enumerated adult migrant population on October 21 included migrant farmworkers but did not include other nonworking family members or children. Third, although we made special efforts to include all migrant camps and other housing units in our original comprehensive list of addresses, it is possible that some smaller housing units (those providing space for fewer than five persons) may have been missed. In future studies, the compiled list of addresses should be matched against all addresses available on the area Migrant Student Record Transfer System, which is a nationwide computerized communications network designed to transfer the education and health records of migrant students as they move from school to school. Unmatched addresses on this computer system should be added to the comprehensive list. These improvements will increase coverage of noncamp housing units, which are the ones most likely to be occupied by migrant families with children.

Even allowing for these limitations, I feel confident in concluding that the present study is one of the few that has provided researchers with a systematic approach to selecting a representative sample of migrant farmworkers. Because migrant farmworkers are highly transitory, sampling this population over an entire growing season tends to be affected by different occupancy rates over time. The weighting procedure was developed to correct this bias and to yield a representative sample. However, weighting a sample may create other problems. For example, statistical analysis performed on a weighted sample is influenced by the weighted sample size. If the weighted number of cases exceeds the actual sample size, tests of significance are inflated; if it is smaller, they are deflated (Moser and Kalton, 1972). To avoid inflated or deflated tests of significance, it is suggested that a weighting factor be used which, when summed, will generate the same number of cases as the unweighted sample. Since ratios between proportions of total migrant population enumerated on October 21 and sampled migrants were used as weights for different size categories, the summed total number of cases for the weighted sample is the same as that of the unweighted sample. Furthermore, the derived population figure for each size category (i.e., weighted sample in each category divided by overall sampling proportion, 0.1124) is the same as that of the enumerated population on October 21.

Following this sampling procedure, the New York Migrant Health Survey collected information on migrant farmworkers' socioeconomic and demographic characteristics, health habits and attitudes, health status, utilization of health services, home community characteristics, and the physical environment of the current residence. Based on data from this survey, analyses of medical utilization patterns and variation in migrant health status have been completed (Chi, 1984a, 1984b). Work on other migrant health-related issues is under way.

References

Chi, Peter S.K. (1984a) "Medical Utilization Patterns of Migrant Farmworkers in New York." Paper presented at the meeting of the Rural Sociological Society. College Station, Texas.

Chi, Peter S.K. (1984b) "Variation in Subjective Well-Being Among Migrant Farmworkers." Ithaca, New York: Cornell University, Department of Consumer Economics and Housing, Working Paper.

Moser, C.A. and G. Kalton. (1972) Survey Methods in Social Investigations. New York: Basic.

Rice, D.P., T.F. Drury and R.H. Mugge. (1980) "Household Health Interviews and Minority Health: The NHCS Perspective." Medical Care, 18:327-335.

Salber, E.J. and A.G. Beza. (1980) "The Health Interview Survey and Minority Health." Medical Care, 18:319-326.

Health Status and Lifestyles

Variation in Subjective Well-Being
Among Black Migrant Farmworkers in New York

by

Peter S.K. Chi

Printed in Rural Sociology, 51(2), 1986.

Abstract

One of the purposes of this study is to see whether the Index of General Well-Being is applicable to migrant farmworkers whose values, life-styles and health may differ from those of the general population.

A second purpose of this research is to compare the level of migrant farmworkers' mental health with that of the general population and to assess the variation in subjective well-being among migrant farmworkers themselves.

A third purpose is to test a multiple regression model on their mental health status to identify factors that explain variation in subjective well-being among migrant farmworkers. The results indicate that variation in subjective well-being among this group is a function of lifestyle, social support, housing conditions, and three background variables (age, sex, and education). Policy implications derived from these results are discussed in the paper.

Introduction

Little is known about the mental health status of migrant farmworkers. Migrants live in conditions that usually are associated with poor mental health: a hazardous occupation, social isolation as a group, low socioeconomic level, poor housing, and possibly physical or cultural barriers to obtaining medical services (The President's Commission on Mental Health, 1978). It is unclear, though, to what degree mental health varies among migrant farmworkers. Further, factors related to their mental health are not well known. Variation in mental health among migrant farmworkers and factors related to it are investigated in this paper.

The development of an Index of General Well-Being (GWB) by the National Center for Health Statistics has provided researchers with a promising measure of self-assessed health status (Dupuy, 1974). While the GWB has been developed and tested on the general American population (see Ware, et al. 1978a; Wan and Livieratos, 1978), few previous studies have examined differences in subcultural groups. One of the purposes of this study is to see whether the GWB is applicable to migrant farmworkers whose values, lifestyles and health may differ from those of the general population.

A second purpose of this study is to compare the level of migrant farmworkers' mental health with that of the general population, and to assess the variation in subjective well-being among migrant farmworkers themselves. A third purpose is to test a multiple regression model to identify factors that explain variation in subjective well-being.

Data

The present study is based on data obtained from the New York Migrant Health Interview Survey conducted in Wayne County, New York in the summer of 1982. Since the largest concentration of migratory farmworkers in the state is in Wayne County, it is an ideal research site for surveying migrant health conditions. In order to obtain a representative sample of migrant farmworkers, a special sampling procedure was designed for this survey. The first step was to compile a comprehensive list of addresses for all migrant camps and other migrant housing units in Wayne County. All units on the list were stratified according to the size of maximum capacity. The total number of migrants that could be accommodated in each size category was known. A representative sample of 218 migrants was randomly drawn through a three-stage sampling procedure from all size categories (the sample size was determined by budget constraints). Special efforts were made on October 21, 1982 to find out from owners of migrant camps and other housing units how many migrant workers were actually living in the units. On the assumption that the sampled migrants had characteristics similar to those of migrants enumerated on October 21, the interviewed migrants can be considered a representative sample of total migrant workers in Wayne County on that day (the detailed sampling procedure is described in Chi, 1985a). Personal interviews were conducted between early July and early November.

Since Cornell Cooperative Extension has operated active migrant education programs in Wayne County for more than 10 years, it enjoys a positive relationship with people and organizations in the area. The present research, with the assistance of Cornell Cooperative Extension, received the full support of local growers and migrant farmworkers. As a result, the rate of interview refusals was very low (less than seven percent of the total sample) and did not vary systematically from camp to camp.

Of the 218 migrant farmworkers in our sample, 76.6 percent were native-born Americans. Also, over 95 percent were black; 77 percent were male and the mean age was 35 years. In general, migrant farmworkers in our sample had a low socioeconomic status. Mean educational level was 9.5 years of schooling and mean annual household income was $5,327 in 1981. Since our respondents were predominately black, the results from this study can be generalized for black migrant farmworkers in New York State.

Dimensionality, Validity and Reliability of Index of General Well-Being

In this study, the Index of General Well-Being (GWB) is constructed according to interviewer-administered responses to 18 questions and all questions are phrased in the context of how an individual has been feeling during the past month. The questions are directly related to presence or severity of some clinical symptoms that are generally considered important in making assessments of subjective well-being (see Appendix 1). The summated scores of 18 items may range from 0 to 110, with higher scores indicating more positive well-being. The actual range of GWB scores in this study is from 30 to 106.

The validity of the GWB index for the general population has been examined using multivariate analyses based on quantitative data from the National Health and Nutrition Examination Survey. The conclusion was that "the GWB may be regarded as a useful tool for portraying the psychological dimension of the health of a given population" (Wan and Livieratos, 1978). In the present study, the same technique of factor analysis will be used to examine data from the migrant sample. In their national study, Wan and Livieratos (1978) used a principal components analysis with varimax rotation to examine the dimensionality of the 18 GWB items. Three common factors were identified in that study, the number being determined by eigenvalues. The first factor, "depressive mood", included six GWB items; the second factor, represented by seven GWB items, reflected the sense of "health concerns"; the final component, "life satisfaction and emotional stability", contained the remaining five GWB items. In order to assure full comparability, the same statistical technique is applied to our migrant sample and the same three factors are prespecified for the factor analysis. The results of this comparison are presented in Table 1.

The first striking result of the test is that 14 out of 18 GWB items in Table 1 have similar patterns of factor loadings in both national and migrant samples. This finding seems to imply that GWB items generally reflect three empirical factors of subjective well-being, regardless of whether they are applied to a general population or to migrant farmworkers; that is, the GWB has a high degree of repeatability.

It should be noted that four GWB items were differently loaded in the two studies. One, nervousness, was considered an aspect of "depressive mood" in the national sample, while in the migrant sample it appeared as a "health concerns" factor. The other three items, good spirits, energy level, and waking up fresh, rested, were parts of the "health concerns" factor in the national sample, but in the migrant sample were associated with "life satisfaction and emotional stability." Theoretically, the factor loadings of these four items in the migrant sample may be more appropriate than their configurations in the national sample. For instance, good spirits, energy level and waking up fresh, rested, certainly indicate a high level of "life satisfaction and emotional stability" rather than a passive expression of "health concerns." In spite of these differences, the most remarkable finding is that, in all the comparisons, a consistent pattern of factor loading exists in both national and migrant samples.

In addition to replicating the factor analysis, Cronbach's alpha was calculated to assess the degree of internal consistency. This coefficient is based on inter-item correlations of the variables making up the factors. When the item intercorrelations are perfect, the alpha coefficient will be equal to unity, whereas when the item intercorrelations are equal to zero, the coefficient will be zero (Zeller and Carmines, 1980). Novick and Lewis (1967) have also shown that Cronbach's alpha is a lower bound of the true reliability. The Cronbach's alpha calculated for the migrant sample is equal to .837, which strongly suggests that the Index of General Well-Being has a high degree of internal consistency. Based on the results from tests of repeatability and consistency, we may conclude that the Index of General Well-Being is a reliable measure of mental health status that is equally as usable for migrant farmworkers as for the general population.

The factor analysis of the General Well-Being scale indicated that the 18 items do not form a single empirical dimension but rather reflect three distinct components of subjective well-being--one positive and two negative. The results of the analysis, however, do not invariably confirm a hypothesis that these three factors measure three different theoretical concepts. The 18 items may be an empirical representation of a single underlying theoretical construct which happens to have three subscales of measurement. Since factor analysis left the theoretical structure of scale items indeterminate, construct validity has been suggested as an appropriate procedure to solve this problem (Zeller and Carmines, 1980).

In contrast to factor analysis, construct validity focuses on the performance of items as they relate to theoretically relevant external variables. In other words, construct validity is assessed by examining the patterns of relationships between the measure being validated and measures of outside variables. Validity is supported when correlation coefficients show the direction and magnitude of relationships hypothesized from theory.

In the Health Insurance Study conducted by Rand Corporation (Ware, et al., 1980), health status was measured not only in terms of its physical, mental and social dimensions but also by an integrative concept, general health perceptions. Measures of general health perceptions ask respondents for a self-rating of their health in general rather than focusing on a specific dimension of health status. Such a general health concept, however, was hypothesized to relate significantly to each of the dimensions of health status, because respondents may consider physical, mental and social health when rating their overall health. Further, measures of different components within the same dimension (e.g., depressive mood, health concerns, life satisfaction and emotional stability within the mental health dimension) should be more highly related to each other than to measures of other health dimensions (e.g., general health perceptions) (Ware, et al., 1980). Empirical tests of these two hypotheses may help to clarify measurement validity of the Index of General Well-Being.

Three measures of general health perceptions were included in the migrant interview questionnaire. The first measure is based on respondent's subjective assessment of his health today as compared with his evaluation of his health two years ago. The responses are "better" (coded as 2), "same" (coded as 1), and "worse" (coded as 0). The second measure is based on a question as to whether respondent's health is better, worse or the same as that of other people of the same age. The coding procedure is the same as for the previous question. The third measure is a projected future health status, based on respondent's answer to the question, "What do you expect your health will be 5 years from now?" Response options range from "much better" (coded as 4) to "much worse" (coded as 0). Since the validity and reliability of the various measures of general health perceptions have been well documented in the literature (see Ware, et al., 1978b), the three general measures of past, present and future health status were used as external variables to assess both dimensionality and validity of the measures of subjective well-being.

The upper panel of Table 2 presents the correlation coefficients between different aspects of subjective well-being and the three external variables. All of the correlations are statistically significant (at least at the .05 level). The three empirical factors of mental health status seem to capture a single underlying dimension rather than different dimensions. Their correlations with three theoretically relevant external variables are very similar to one another in terms of direction, strength and consistency (comparing coefficients across each row). Moreover, the lower panel of Table 2 indicates that all intercorrelations among different components of subjective well-being are substantially higher than their correlations with the three external variables. Both findings enable us to conclude that GWB items are, indeed, measures of a single dimension of mental health status.

The significant positive association found between subjective well-being and general health perceptions provides only one piece of evidence supporting the construct validity of the GWB index. Ideally, construct validity requires a pattern of consistent findings involving different researchers across a significant period of time and using a variety of diverse but theoretically relevant variables (Zeller and Carmines, 1980). Fortunately, the Index of General Well-Being was not only validated with data from the National Health and Nutrition Examination Survey (Wan and Livieratos, 1978), it was also compared with a variety of psychological scales constructed from a college student sample (Fazio, 1977). The latter study concluded that the Index of General Well-Being is "a homogeneous scale basically measuring a singular dimension of general psychological state." Thus, the three subscales of the GWB derived from the factor analysis also measure some properties of a unidimensional concept--subjective well-being.

Comparisons of Levels of Subjective Well-Being Between Migrant Farmworkers and the General Population

Following the tests of reliability and validity, levels of mental health status among migrant farmworkers were compared with those of the general population. Figures for the latter sample are from Wan and Livieratos (1978). Table 1 shows that migrant farmworkers, in general, have a slightly lower level of subjective well-being (78.38) than the general population (80.34). Considering the linkage between socioeconomic status and mental health problems (Hollingshead and Redlich, 1967: Roberts and Myers, 1968: Bastide, 1972), the overall mental health status of migrant farmworkers in our sample seems to be higher than one would expect from their poor social and economic conditions. It is postulated that the strong determination of migrant farmworkers and their extraordinary ability to adjust to social conditions may have substantially reduced the adverse effects of both low socioeconomic status and stressful migratory experience. Special attention is given to age and sex differentials in the subjective rating of general well-being because age-sex differentials have been consistently found in the literature and comparable national data are available. Table 3 presents male-female comparisons between the general population and migrant farmworkers. Two specific points can be identified: first, men exhibit higher mean GWB scores than women, among both migrants and the general population; and second, the sex difference in mean GWB scores within each sample (6.0 for the national sample and 7.4 for the migrant sample) is greater than the mean GWB score difference between national and migrant samples within each sex category (3.5 for men and 4.9 for women). In sum, the sex differences are more important than the differences between the general population and migrants.

Age differences in the subjective rating of general well-being are presented in the appendix. With respect to the total GWB scores, younger migrant farmworkers (25 to 34 years of age) have somewhat lower scores (about 5 points) than the general population in the same age group, while older migrant farmworkers (aged 35 to 64) have slightly higher scores than their counterparts in the general population.

Factors Affecting Subjective Well-Being

It is hypothesized that a migrant farmworker's subjective well-being is a function of his lifestyle, social support, housing conditions, medical care and various background variables. The specific relationships between these five sets of variables and subjective well-being will be discussed in this section; in the next section a multiple regression model will be constructed to test this general hypothesis.

1. Lifestyle

Based on previous research (Fuchs, 1974; Breslow and Belloc cited in Somers, 1976), which has shown that life expectancy and better health are significantly related to a number of simple but basic health habits related to lifestyle, eight basic health habits have been used in the current study to develop composite measures of lifestyle. The technique of principal component factor analysis with varimax rotation has been used to examine the dimensionality of the eight items and the results are shown in Table 4. A summated score of respective items in each factor was computed as a composite measure. For instance, the score for the first factor, regular meals and exercise, is the sum of three items and has a range of 0 to 3; the score for the second factor, adding three smoking and drinking items, ranges from 0 to 12;

and the score for the third factor, a sum of two items on consuming sweets, varies from 0 to 8 (see Table 5). Based on the summated measures, we hypothesize that (1) the higher the score on regular meals and exercise, the higher the level of the migrant's subjective well-being, and (2) the higher the scores on smoking and drinking or consuming sweets, the lower the level of the migrant's subjective well-being.

2. Social Support

In the literature, many researchers have proposed that socially isolated individuals are at higher risk for mental disorder (Faris 1934, Jaco, 1954; Kohn and Clausen, 1955; Pearlin and Johnson, 1977), while socially integrated people are at an advantage with respect to mental disorder in that they can spread the load of stress during a crisis situation. In this study, social support is divided into two components: intra-familial and extra-familial supports. Marital status and presence of other family members are used to measure intra-familial support. Although a recent study found that marriage is not always conducive to good mental health (Hughes and Gove, 1981), the nature of the marital bond tends to provide broad social networks and a high degree of mutual assistance. It is therefore hypothesized that married respondents tend to receive more social support and to have higher level of subjective well-being than respondents in other marital statuses. Since migrant farmworkers are highly transitory, they are usually uprooted and face a high degree of uncertainty during the migration season. However, if migrants have brought family members with them, this companionship may provide them with additional social support. It is, therefore, hypothesized that migrants who have family members currently living with them would tend to have a higher level of subjective well-being than those who do not.

Extra-familial support is measured in terms of involvement in religious and sports groups in the home community and participation in volunteer work for a community service (all three are dummy variables). It is hypothesized that migrants who engage in these extra-familial activities tend to receive a high degree of social support and in turn to possess a high level of subjective well-being.

3. Housing Conditions

One traditional focus of public health research has been to examine the effects of housing and environmental factors on health and behavior (Ford, 1936; Winslow et al., 1939; Wilner et al., 1962;

Bureau of Community Environmental Management, 1970; Hinkle and Loring, 1977). Although specific associations between poor housing and ill health have not been conclusively demonstrated, agreement is widespread that some interactions exist among poverty, malnutrition, social disadvantages, substandard housing and a low level of health status.

Three housing variables are used in this study. One is homeownership (1 = owner, 0 = renter). Since homeowners usually occupy better housing units and have a higher degree of self-esteem than renters, we expect that those migrants who are homeowners in the home community tend to have a higher level of subjective well-being than renters. The other two dummy variables are "living in a substandard housing unit in the home community," and "living in a substandard housing unit in Wayne County, New York." Conditions of substandard housing were determined by a set of questions on the physical structure and availability of hot running water inside, flush toilet, and bathtub or shower for private use. It is hypothesized that living in substandard housing is negatively related to subjective well-being.

4. Medical Care

Private insurance coverage and physician visits for preventive care are the two variables used in this study to measure migrants' medical care. It is hypothesized that private insurance coverage and frequent visits to physicians for preventive care may be positively related to subjective well-being.

5. Background Variables

Age, sex, education and annual household income are the four traditional background variables used in this study. Based on previous findings in the literature, women are expected to have a lower level of subjective well-being than men, and older migrants, a higher level than younger migrants. The final hypothesis is that education and income may be positively related to a migrant's subjective well-being.

6. The Dependent Variable

The Index of General Well-Being (GWB), a summated score of 18 items, is a composite measure of the ultimate dependent variable, overall subjective well-being. The method of analysis used is the ordinary least square (OLS) multiple regression.

Findings from the Multiple Regression Model

Table 5 shows the means and standard deviations of dependent and independent variables used in the regression analysis of the Index of General Well-Being. The results of the regression model are also presented in Table 5.

In the model, ten variables are found to be significantly related to the general level of subjective well-being (as measured by the Index of General Well-Being). As expected, age, sex, education, marital status and companionship at the migrant camp, volunteer work for community services, regular meals and exercise all show a positive relationship with the Index of General Well-Being. Migrants who live in substandard housing in their home community tend to have a lower level of subjective well-being than those in standard housing.

One unexpected result from the model is that religious participation seems to be associated with a low score on general well-being (-4.323). This finding seems to imply that migrants who have a low level of subjective well-being are likely to seek religious groups for social support, rather than that access to religious groups leads to a low level of subjective well-being. This interpretation conforms to the "comfort hypothesis" in the sociology of religion (Glock et al. 1967; Stark, 1972; Glock, 1973). Also unexpectedly, the preventive health care variable, visits to physicians for diagnostic and preventive medical care, shows a negative relationship with subjective well-being (-.408). This result may reflect the fact that migrants who visit physicians more frequently are usually those who already have a high degree of health concerns or a low level of subjective well-being. That is, those who tend to visit the doctor are more likely to be sick; they also may be the ones to get preventive care. There seems to be a correlation between "sick" visits and "well" visits to physicians.

A surprising result from the regression analysis is that household income, health insurance, homeownership and participation in sports show no relationship with variation in subjective well-being among migrant farmworkers. The homogeneous income earnings and generally low level of private health insurance coverage among our respondents (Chi, 1985b) may have diminished the explanatory power of these two variables. A low rate of homeownership (27%, see Table 5) and lack of differences in quality between owner-occupied and rental housing units for the migrant population (Chi, 1985c) may have reduced the impact of homeownership on variation in subjective well-being. Although a substantial portion of migrant farmworkers reported engaging in various sports (0.33, see Table 5), such participation does not have any direct effect on a migrant's mental health status when other independent variables are statistically controlled.

Discussion and Recommendations

The study has demonstrated that the Index of General Well-Being (GWB) can be validly and reliably used as a composite measure of the mental health status of migrant farmworkers. A qualification, however, should be noted. Over 95 percent of the sample in this study were Black-Americans or English-speaking immigrants. To evaluate the validity or reliability of the index for a non-English speaking population (such as Haitians and Mexicans), a translated version of the questionnaire should be tested in a predominately non-English speaking area (such as Orange County, New York) in which Spanish-speaking immigrants are centered.

Some policy implications have been derived from the regression analysis of subjective well-being among migrant farmworkers. First, regular meals and exercise are found to be positively associated with subjective well-being. A health education program that emphasizes proper eating habits and regular exercise may help migrant farmworkers improve their subjective well-being.

Second, since housing conditions in the home community seem to have a negative impact on the mental health status of migrant farmworkers, provision of decent housing at migrant camps alone may not necessarily improve their subjective well-being. Improvements in migrant housing, therefore, should be made at home and in the New York State communities where they work.

Third, social support is found in the regression model to be a powerful mechanism to improve migrants' subjective well-being. Specifically, stable marriage, continuing companionship of family members during the migration season and volunteer work for community services may positively contribute to subjective well-being. A community program designed to organize and motivate migrant farmworkers for volunteer work not only can improve their relationship with the local community but also can reinforce their own psychological well-being.

Fourth, the finding that the health care variable, visits to physicians for diagnostic and preventive medical care, is negatively associated with subjective well-being indicates inadequacy in preventive health care among migrant farmworkers. They usually call upon the medical profession only when their illness symptoms reach crisis proportions (Chi, 1985b). For future improvement of migrants' subjective well-being, use of medical services for preventive purposes should be one of the major foci of migrant health care. Migrant health centers and community health centers should include preventive medicine as an integral part of total health care for migrant farmworkers.

Finally, any specific program designed to improve the mental health status of migrant farmworkers should be targeted toward young, female and less-educated migrants. These groups more than other migrant farmworkers tend to have low levels of subjective well-being.

References

Bastide, R. (1972.) The Sociology of Mental Disorder. New York: David Mckey Co., :139-152.

Bureau of Community Environmental Management, PHS. (1970). Proceedings of the First Invitational Conference on Health Research in Housing and Its Environment. Washington, D.C.: U.S. Government Printing Office.

Chi, P. S. K. (1985a). "A Note on Sampling Migrant Farm Workers," The Rural Sociologist, 5(3):158-162.

____ (1985b). "Medical Utilization Patterns of Migrant Farmworkers in Wayne County, New York," Public Health Reports 100(5):480-490.

____ (1985c). "A Tale of Two Homes: A Study of Housing Conditions of Migrant Farmworkers," a working paper, Dept. of Consumer Economics and Housing, Cornell University, Ithaca, New York.

Dupuy, D. F. (1974). "Utility of the National Center for Health Statistics' General Well-Being Schedule in the Assessment of Self-Representation of Subjective Well-Being and Distress," paper presented at the National Conference on the Evaluation of Drug, Alcohol and Mental Health Programs, Washington, D.C.

Faris, W. W. (1934). "Cultural Isolation and the Schizophrenic Personality," American Journal of Sociology, 40:156-164.

Fazio, A. F. (1977). A Concurrent Validational Study of the NCHS General Well-Being Schedule. Hyattsville, Md.: National Center for Health Statistics, Series 2, No. 73.

Ford, J. (1936). Slums and Housing. Cambridge, Mass.: Harvard University Press.

Fuchs, V. R. (1974). Who Shall Live? Health, Economics and Social Choice. New York: Basic Books, Inc.

Glock, C. Y. (1973). "On the Origin and Evolution of Religious Groups," pp. 207-220 in C. Y. Glock (ed.), Religion in Sociological Perspective: Essays in the Empirical Study of Religion. Belmont, Calif.: Wadsworth.

Glock, C. Y. et al. (1967). To Comfort and to Challenge. Berkeley, Calif.: University of California Press.

Hinkle, L. E., Jr. and W. C. Loring (eds.).(1977). The Effects of the Man-Made Environment on Health and Behavior. Washington, D.C.: U.S. Government Printing Office.

Hollingshead, A. B. and F. C. Redlich. (1967). Social Class and Mental Illness: A Community Study. New York: John Wiley and Sons: 220-249.

Hughes, M. and W. R. Gove. (1981). "Living Alone, Social Integration and Mental Health," American Journal of Sociology, 87(1):48-74.

Gartley, J. E. (1954). "The Social Isolation Hypothesis and Schizophrenia," American Sociological Review, 27(August):409-480.

Kohn, M. and J. Clausen. (1955) "Social Isolation and Schizophrenia," American Sociological Review, 20:265-272.

Novick, M.H. and C. Lewis. (1967). "Coefficient Alpha and the Reliability of Composite Measurements," Psychometrika, 32(March):1-13.

Pearlin, L.I. and J.S. Johnson. (1977). "Marital Status, Life Strains and Depression," American Sociological Review, 42(October):704-715.

The President's Commission on Mental Health. (1978). Task Panel Reports: Migrant and Seasonal Farmworkers. Washington, D.C.: U.S. Department of Commerce, National Technical Information Service(PB-279816).

Roberts, B. H. and J.K. Myers. (1968). "Religion, National Origin, Immigration and Mental Illness," pp. 139-147 in S.P. Spitzer and N.K. Densin (eds.), The Mental Patient: Studies in the Sociology of Deviance. New York: McGraw Hill.

Somers, A. R. (ed.). (1976). Promoting Health: Consumer Education and National Policy, Germantown, Maryland: Aspen Systems Corporation.

Stark, R. (1972). "The Economics of Piety: Religious Commitment and Social Class," pp. 488-503 in G. W. Thiebar and S.D. Feldman (eds.), Issues in Social Inequality, Boston: Little, Brown.

Wan, T. T. H. and B. Livieratos. (1978). "Interpreting a General Index of Subjective Well-Being," Milbank Memorial Fund Quarterly, 56(4).

Ware, J. E. Jr., et al. (1978a). Mental Health, Vol. III. Santa Monica, Ca.: Rand Corporation R-1987/3-HEW.

___. (1978b). General Health Perceptions, Vol. V. Santa Monica, Ca.: Rand Corporation R-1987/5-HEW.

___. (1980). Conceptualization and Measurement of Health for Adults in the Health Insurance Study, Vol. I, Model of Health and Methodology. Santa Monica, Ca.: Rand Corporation, R-1987/1-HEW.

Wilner, D. M., et al. (1962). The Housing Environment and Family Life. Baltimore, Md.: The Johns Hopkins Press.

Winslow, C.E.A., et al. (1939). Basic Principles of Healthful Housing. New York: American Public Health Association Inc.

Zeller R. A. and E. G. Carmines. (1980). Measurement in the Social Sciences, New York: The Cambridge University Press, Chapters 3 and 4.

Table 1. The factor analysis and zero-order correlation between each of the 18 general well-being (GWB) items and the total GWB score, comparison between national[a] and migrant samples.

	Factor loading		Correlation coefficient	
GWB Item	National	Migrant	National	Migrant
1. Depressive mood				
Downhearted and blue (8[b])	0.581	0.731	0.744	0.674
Sad, discouraged, hopeless (10)	0.613	0.823	0.690	0.545
Anxious, worried, upset (12)	0.733	0.657	0.717	0.643
Under stress, pressure (13)	0.633	0.662	0.646	0.648
Afraid of losing mind or control (18)	0.398	0.640	0.517	0.471
[Nervousness]	0.566	.---	0.702	.---
2. Health concerns				
Bothered by bodily disorders (1)	0.613	0.503	0.625	0.441
Health concern (2)	0.558	0.539	0.669	0.291
Feeling tired, worn-out (3)	0.668	0.562	0.706	0.502
Relaxed (15)	0.500	0.536	0.796	0.633
Nervousness (14)	.---	0.512	.---	0.521
[Good spirits]	0.450	.---	0.730	.---
[Energy level]	0.563	.---	0.673	.---
[Waking up fresh, rested]	0.537	.---	0.639	.---
3. Life satisfaction and emotional stability				
Satisfied with life (6)	0.529	0.460	0.587	0.359
Interesting daily life (7)	0.629	0.539	0.590	0.420
Depressed, cheerful (11)	0.536	0.486	0.751	0.716
Firm control of emotions (16)	0.465	0.506	0.560	0.546
Emotionally stable (17)	0.569	0.605	0.605	0.522
Good spirits (9)	.---	0.517	.---	0.545
Energy level (5)	.---	0.470	.---	0.552
Waking up fresh, rested (4)	.---	0.595	.---	0.347
GWB Score: Mean	80.340	78.38		
Standard Deviation	17.676	15.82		
Cronbach's alpha[c]				0.837

[a] National results are obtained from Wan and Livieratos 1978, p. 542

[b] Numbers in the parentheses are the equivalent GWB items in the appendix.

[c] $\alpha = [a/(a-1)][1-a/(a+2b)]$ where a = number of items in the composite and b = sum of the correlations among the items.

Table 2. Correlations between components[a] of subjective well-being and three measures of general health perceptions

	Depressive mood[b]	Health concerns[c]	Life satisfaction and emotional stability[d]	General well-being[e]
Measures of general health perceptions				
(1) Compared with health 2 years ago	.150*	.291**	.177*	.247**
(2) Compared own health with that of others of same age	.143*	.134*	.190*	.200**
(3) Expected health 5 years from now	.255**	.243**	.272**	.319**
Components of subjective well-being				
(1) Depressive mood	1.00	.382**	.611**	.781**
(2) Health concerns		1.00	.390**	.739**
(3) Life Satisfaction and emotional stability			1.00	.870**
(4) General well-being				1.00

[a] Items included in different components of subjective well-being are described in Table 1.

[b] "Measure of depressive mood" is a summated score of five GWB items loaded in factor 1 on Table 1.

[c] "Measure of health concern" is a summated score of five GWB items loaded in factor 2 on Table 1.

[d] "Measure of life satisfaction and emotional stability" is a summated score of eight items loaded in factor 3 on Table 1.

[e] Index of General Well-being is a summated score of 18 GWB items.

*Significant at 0.05 or lower level.

**Significant at 0.01 or lower level.

Table 3. Means of total GWB scores by sex, comparison between national[a] and migrant samples

Sex	Samples		
	National	Migrant	Difference
Male	83.6	80.1	3.5
Female	77.6	72.7	4.9
Difference	6.0	7.4	1.4

[a] National GWB scores are obtained from Wan and Livieratos 1978, Figure 1.

72

Table 4. A factor analysis of life-style items (rotated factor pattern)

Items	(1) Regular meals and exercise	(2) smoking and drinking	(3) Consuming sweets
(1) Three meals	0.708	-0.201	0.071
(2) Breakfast 0.784	-0.169	0.117	
(3) Exercise	0.602	0.370	-0.165
(4) Smoking cigarettes	-0.317	0.579	0.030
(5) Drinking beer or liquor	0.133	0.830	-0.067
(6) Drinking coffee or tea	-0.121	0.209	0.150
(7) Eating candy	0.189	0.087	0.771
(8) Drinking soda	-0.066	-0.062	0.781

Table 5. Means, standard deviations, and regression analysis[a] of subjective well-being among migrant farm workers in Wayne County, New York

Variable	Mean	Standard deviations	Regression coefficient	t statistic	Level of significance
Dependent variable: Index of General Well-being	78.38	15.82			
Independent variables					
Background variables					
(1) Age	34.88	11.73	0.339	2.88	.0046
(2) Sex	0.77	0.43	8.582	2.79	.0059
(3) Education	9.60	3.08	1.027	2.58	.0110
(4) Household income	2.17	1.20	1.412	1.55	NS
Housing variables					
(1) Ownership	0.27	0.45	1.159	0.38	NS
(2) Substandard housing at home	0.24	0.43	-4.760	-1.85	.0667
(3) Substandard housing in Wayne County	0.69	0.47	-3.062	-1.18	NS
Intra-familial support					
(1) Marital status					
Single	0.38	0.49	4.590	1.60	NS
Married	0.37	0.49	6.116	2.13	.0346
(2) Companionship	0.93	1.37	1.654	1.69	.0933
Extra-familial support					
(1) Religious groups	0.38	0.49	-4.323	-1.70	.0912
(2) Sports groups	0.33	0.48	2.420	0.99	NS
(3) Volunteer work	0.15	0.36	5.445	1.66	.0997
Health care variables					
(1) Health insurance	0.43	0.86	0.594	0.47	NS
(2) Physician visits	1.94	4.91	-0.408	-1.87	.0631
Life-style factors					
(1) Regular meals and exercise[b]	2.28	0.94	3.332	2.69	.0081
(2) Smoking and drinking[c]	3.32	2.10	-0.745	-1.39	NS
(3) Consuming sweets[d]	3.49	1.80	0.114	0.18	NS
Intercept			39.991	4.68	.0001
F-value			4.288		.001
Adjusted R			.269		
N			161		

(Table 5 continued)

[a] A zero-order correlation matrix is available upon request from the author.

[b] This measure is based on a summated score of three questions:

(1) Do you eat three meals a day? (1=yes, 0=no)

(2) Do you eat breakfast every day? (1=yes, 0=no)

(3) Do you exercise frequently? (1=yes, 0=no)

[c] This measure is based on a summated score of three questions:

(1) Do you drink beer or liquor? (o=never, 1=rarely, 2=every few days, 3=once a day, 4= several times a day)

(2) Do you smoke cigarettes? (0=not smoking, 1=less than one pack a day, 2=one pack a day, 3=two packs a day, 4=more than two packs a day)

(3) How many cups of coffee (or tea) do you drink every day: Range from 0 to 4 (four or more cups)

"Drinking, Farm and Camp Life: A Study of Drinking Behavior in Migrant Camps in New York State"*

By

Peter S.K. Chi and Janet McClain

Printed in Journal of Rural Health, (Forthcoming, 1992)

ABSTRACT

This research focuses on issues of alcohol consumption among migrant farmworkers in Orange County, New York. Since drinking is a common behavioral response to erratic hard work and dull camp life, variation in alcohol consumption was analyzed within the context of a holistic perspective on migrant life. Although migrant farmworkers tend to drink more in the camp than in the home community, the multivariate analysis indicates that variation in drinking among migrant farmworkers is primarily affected by socialization and social support factors, not by work-related variables. Potential strategies for modifying migrant farmworkers' drinking behavior are discussed based on the results of this study.

Introduction

Studies of the relationship between alcohol use and occupational status indicate that the probability of problems related to drinking among migrant farmworkers is the highest of all occupational groups, even including unemployed persons (Marden, undated). In a questionnaire survey of 96 migrant health centers, 66 community mental health centers, and 33 projects of the National Institute of Alcohol Abuse and Alcoholism located in the migration streams, the President's Commission on Mental Health found that alcoholism is viewed by 60 percent of the directors who responded to the questionnaire as the most significant health problem, followed by anxiety (cited by 50 percent) and depression (cited by 40 percent). (The President's Commission on Mental Health, 1978).

Commonly referred to as a health problem, alcohol use among migrant farmworkers has rarely been studied independently or as a part of health status and community development studies although a 1983 study (Kunitz et al.) conducted in two counties in western New York State clearly indicates the need for research in this area. In that study drinking behavior was examined in 13 migrant camps; measures of quantity and frequency of consumption were the key indicators of alcohol use and the results of alcohol consumption were measured by the Mulford Scale (Mulford, 1964). Basically, this is a descriptive study based on a nonrepresentative sample. Another study was conducted by Wlodarczk (1979), who reviewed the employment and social conditions of hired agricultural workers and analyzed why these conditions may lead workers to alcohol consumption. Her study was an examination of the development and organization of alcoholism services for the special treatment of migrant farmworkers, not an empirical survey of alcohol consumption among the farmworkers themselves.

The current research focuses on multivariate analysis of alcohol consumption among a representative sample of migrant farmworkers randomly selected from Orange County, New York. It is hypothesized that migrant drinking is influenced by the interaction of demographic, socialization, social support and work-related variables.

75

Theoretical Framework

Since drinking is a common behavioral response to erratic hard work and dull camp life (Friedland and Nelkin, 1971), variation in alcohol consumption should be analyzed within the context of a holistic perspective on migrant life. The factors expected to affect the level of alcohol consumption can be loosely grouped under four headings: demographic, socialization, social support and work-related.

Studies of drinking patterns in ethnic communities indicate that variation in drinking patterns among different racial and ethnic groups tends to be confounded with age and sex factors. For instance, Caetano's study (1984) shows that black women aged 50-59 were more likely to be nondrinkers, whereas younger Hispanic women (aged 18-29) were the ones who either drank infrequently or abstained. While black men aged 30-59 had higher rates of being heavy drinkers as well as higher rates of not drinking, among Hispanics, younger men were four times more likely than older men to be heavy drinkers. In order to isolate the independent effects of sex, race and ethnicity, age will be used as a control variable in the multivariate analysis.

Previous studies indicated that men reported higher rates of drinking than women because of stress and personal needs (Mulford, 1964; Clark, 1982). Men also expressed greater social approval of drinking and held more positive attitudes toward it than women did. In general, men are more likely to be socialized in favor of drinking than women are, since being drunk is excused by family and friends for men, but for women it is socially unacceptable.

Ethnic origin, the second socialization variable, indicates a distinct cultural background as well as unique patterns of social interactions. A number of studies clearly indicate that drinking patterns among different racial and ethnic groups vary significantly. For example, Caetano (1984) studied drinking patterns of white, black and Hispanic residents in three counties of the Eastern Bay area in northern California. The results from this study show that white men had the highest number of abstainers, followed by Hispanic men, although black and Hispanic women abstained more frequently than all men and white women. Caetano concluded that, given their more liberal attitudes toward drinking, alcohol played a larger role in family celebrations and social life for Hispanics than for either the black or white survey participants.

Gordon (1985) has examined the adaptation of different ethnic groups in Hispanic communities to life styles in the United States. Since the Puerto Rican population has the longest tenure in urban areas in the Northeast, he argues that their drinking patterns reflect the most acculturation. Basically, he found that Puerto Rican men follow the traditional "American working men's pattern" of drinking at the end of a work day in taverns with other non-Hispanic co-workers and continue such social traditions as weekend gatherings for men or friends. As a result, Puerto Rican men in that study tended to have higher rates of alcohol consumption than other Hispanic groups.

Caetano suggests that drinking patterns of ethnic groups reflect the extent to which the drinker has assumed the characteristic social practice of their resident communities. He found that both blacks and more acculturated Hispanics are likely to endorse the social norm of "enjoying a party" but that Hispanic men are also more likely to drink for "relieving tension" (Caetano, 1984, 1987). According to Neff et al. (1987), more-acculturated Hispanics drink more frequently than those less-acculturated and demonstrate a more positive well-being but also have greater likelihood of depressive symptoms similar to those expressed by Anglos and blacks. For a detailed review of the literature on acculturation and drinking, see Gilbert and Cervantes (1986).

The third socialization variable is parents' drinking status. Children's drinking is usually influenced by parents' drinking behavior. One study (Markides et al., 1988) indicates that if the parents were drinkers, the younger generation was "2.8 times more likely to be drinkers" than the children of abstainers, partly because they witness their parents' alcohol use and partly because they may be socially and biologically more susceptible to alcohol dependency. It is quite probable that children are more likely to start drinking earlier if their parents are drinkers.

Marital status and presence of family members at camp are used in this study to measure social support. Since the nature of the marital bond tends to provide broad social networks and a high degree of mutual assistance, it is hypothesized that the married respondent is less likely to become a regular drinker than a nonmarried one is. Presence of family members in the camp provides a network of social support; also, families tend to have their own vehicles and are more likely to have made some contact with the local community through religious and recreational activities and, therefore, to have less need for recreational drinking. Further, Trotter (1985) argues, rules about drinking are much stricter in family camps than at camps with predominantly single men. Families tend to have a long-term relationship with their employers and have more at stake if excessive drinking causes disturbances in the camp.

Type of occupation is another factor that has been found to have a distinct influence on alcohol consumption. Previous studies (Hitz, 1973 and Siassi et al., 1973) have shown that alcohol use is common among workers in higher risk occupations and lower status jobs as a result of an unpredictable or erratic structure of work. The most serious problems emerge among shift workers and the unemployed (Smart, 1979).

Other researchers have pointed out that some occupations seem to accept or encourage drinking more than others, because drinking serves to create a value system for peer assessment of workers. Mars (1987) emphasizes that drinking forms a subculture among longshoremen, in which men are judged by other workers according to their tolerance for alcohol and how much money they spend on it. The minority of longshoremen who do not drink are often excluded from social activities or viewed with suspicion. Fine et al. (1982) argues that work sites create social and cultural norms for drinking behavior by "informally sanctioning or overlooking alcohol use." This endorsement of drinking leads to the belief that alcohol consumption is required in order to be part of the social community at work.

Drinking may serve as the primary social activity for migrant farmworkers in much the same way as it does for longshoremen. Because of lack of attachment to the surrounding community, most migrant farmworkers drink at home in their camp unit or outside with their close friends and neighbors on the beaten paths that serve as outdoor living rooms. Usually, men and women drink in separate groups. Drinking takes place both in a "weekly context" after a hard day's work and on the "weekend," usually starting on Friday afternoon when pay is dispensed.

Since drinking patterns of migrant farmworkers seem to be closely related to camp life, it is essential to examine the relationship between drinking status and some work-related variables. Years worked as a farmworker, daily work hours, whether respondent was ever pressured to drink and distance from camp to liquor store are the work-related variables used in the present study. It is hypothesized that migrant farmworkers will form a unique social group which may foster a strong norm for a higher level of drinking and the longer the time of being a farmworker the greater the probability of being a regular drinker. Further, long working hours may also increase the need for drinking after a day's hard work or during weekends. Migrant farmworkers who have felt pressure from their colleagues to drink may be more likely to become regular drinkers. Finally, migrant farmworkers who live in camps near small grocery or liquor stores are expected to drink more frequently because liquor is less expensive and more accessible than for those living farther away who may be dependent on informal sales in the camp.

Research Site and Sampling Design

This study was conducted in Orange County, New York in the summer of 1986. Orange County is a medium size county of 826 square miles which is becoming rapidly urbanized as a result of its proximity to New York City, Westchester County and urbanized areas of northern New Jersey. Agricultural statistics show the changing character of the county most clearly. In 1950, close to 3000 farms were operating in Orange County, by 1980, only 844 farms remained. A little over half of the county's land area (51.6%) was in agricultural production in 1950; by 1980, this area had declined to less than one quarter (24.7%). Between 1970 and 1980, the adjusted market value of sold agricultural products decreased more than 20 percent (from $91 million to $73 million). Despite a steady decline in agriculture, Orange County continues to have one of the largest concentrations of migrant farmworkers in New York State and this population is racially and ethnically diversified. Orange County likewise has well established local migrant health services. Given these features and its long history of agricultural migrant workers, this county provided an excellent opportunity to study drinking behavior and other related health issues of migrant farmworkers.

82

Orange County is one of the leading areas in production of onions, apples, and other vegetables and fruits in New York State. Harvesting and processing these crops depend largely on the seasonal migration of farmworkers.

As pointed out by Chi (1985), collecting information, particularly health data, from a representative sample of migrant farmworkers is extremely complicated. Not only are these farmworkers highly transitory but their household composition and living arrangements do not meet standard census definitions of established households and residency. To take account of these difficulties, in-depth local surveys have been recommended as a more suitable means of collecting health data in seasonal migrant populations.

In order to obtain a representative sample of migrant farmworkers from which to collect health statistics and information on drinking, a special sampling procedure was designed for this survey. The first step was to compile a comprehensive list of addresses for migrant camps and other migrant housing units in Orange County. A total of 29 migrant camps and 9 housing units (including trailers) were identified in 1986. Migrant families with children in Orange County tend to live predominately in the smaller migrant camps or in individual housing units where accommodations are more suitable for families. Large migrant camps usually accommodate younger men and women working on their own or with siblings. Many of these younger workers come on contract from Haiti and Jamaica. Stratifying for migrant living units by size of maximum capacity controls for household composition to some extent. The maximum number of migrants that could be accommodated in these facilities was known, 876.

The preliminary sample size was 30% of the maximum number of migrants in each size category (the sample size was determined by budget constraints) and the expected sample size would be 263 (876 x .30). Since drawing a 30% random sample from all camps was difficult and unaffordable, a three-stage sampling procedure was followed. First, a partial sample of migrant camp and housing units was randomly selected for each size category. This selection was based on the assumption that the average size was the midpoint of each size category and that at least 50% of the units within each category were currently occupied. Second, up to 50% of the housing units were randomly selected from each of the sample camps

83

and other housing units. If the occupancy rate was less than 50%, all occupied units were included in the survey. Third, working adult members of the randomly selected households were approached and their cooperation was solicited for participation in the interviews.

Special efforts were made between August 20 and 22, 1986, to find out from owners of migrant camps and other housing units how many migrant workers were actually living in the units (a total of 614 adult migrant farmworkers was reported). On the assumption that sampled migrants had characteristics similar to those of migrants enumerated between August 20 and 22, the interviewed migrants can be considered a representative sample of total migrant farmworkers in Orange County during the three days.

The number of migrant farmworkers actually sampled (246) was lower than the expected sample size (263) because of uneven occupancy rates in some camps and the unexpected closing of one of the large farming and packing operations, which resulted in the closure of three camps. Since each respondent was paid $10 for a one-hour interview, which is about three times the average hour-rate for farmwork, the number of refusals was negligible.

Interviewing started in the camps where workers who harvested the early salad vegetable crops lived and ended in the camps where workers were harvesting late apples. Since levels of occupancy varied, we under-sampled at the beginning and end of each crop season, and over-sampled in the middle of the season. To adjust for this sampling bias, a ratio between proportions of total migrants and sample migrants was calculated for each size category. In the camp size of 11-20, for example, where 17.1% of the migrant worker population lived, a slightly higher percentage (24.4) of migrants were selected for interviews. A weighting factor of 0.70115 (.17101/.24390) was used in the statistical analysis to correct for over-sampling. The detailed sampling procedure and use of the weighting factor have been described elsewhere (Chi, 1985).

Of the 246 migrant farmworkers in our sample, over 83% were male and 55% were married. The sample also includes diversified racial and ethnic groups: Puerto Ricans (34%), Mexicans (31%), blacks (13%), Jamaicans (9%), Haitians (5%) and others (8%). As might be expected, migrants farmworkers in this sample had a low socioeconomic status. Mean educational level was 7.1 years of schooling and average weekly wage was $199 in 1986. Respondents in our sample had worked an average of 12.6 years as farmworkers.

Measurement of Drinking

A number of different methodologies have been used to study drinking behavior. First, situation-specific measures of the amount consumed on any one occasion are used to make inferences based on the validity of a self-report. Self-reports are collected on quantity-frequency measures of alcohol consumption, or on a combination of quantity measures and measures of perception of drunkenness (Clark, 1982). Second, norms may be established for drinking behavior and then degrees of alcohol use are measured based on the effects of intervening variables such as unemployment (Seeman et al., 1983; 1988) or stressful life events (Linsky et al., 1987). Third, drinking may also be viewed from a social context in which people are influenced by social interaction and the environment around them (Prus, 1983; Glynn et al., 1983). Drinking practices may also be influenced by acculturation (Gilbert and Cervantes, 1986; Neff et al., 1987).

Since migrant farmworkers are racially and ethnically diversified and since their drinking behavior has rarely been researched, no existing scientific knowledge nor any common cultural background could be used to establish general norms of drinking behavior for migrant farmworkers. As a result, we will combine the first and third approaches in our study: self-reports and an examination of the social context of drinking.

Although 246 migrant farmworkers were randomly selected, nine of them were excluded from this study because they failed to provide any information on drinking. Other respondents may not answer every question in the questionnaire and some missing values may appear in the analysis. For accuracy, we presented the valid number of cases separately for different analyses.

Respondents in our sample were first asked whether they drank regularly, occasionally or not at all. Three distinct groups were identified by this question: regular drinkers (58%), occasional drinkers (23%) and nondrinkers (18%). In order to validate this self-reported drinking status, frequency and volume of drinking were also asked of all respondents. If self-reported drinking status is indeed consistent with the latter two measures of drinking, then self-reporting may be considered a reliable way to identify the migrant's drinking status. Table 1 shows some consistent relationships between self-reported drinking status and frequency and volume of drinking. First, regular drinkers are more likely than occasional drinkers to drink daily in the home community. Among regular drinkers, the highest frequency of drinking was on weekends and holidays, either at home or at camp, while among occasional drinkers, the highest frequency in either place was only a few times a year. Second, over 47% of occasional drinkers reported taking only one drink or beer at a time, in contrast to regular drinkers, 39% of whom reported drinking more than a quart each time (the quantity of drinking was referred to the most preferred drink). Finally, only 1 or 2 nondrinkers drank more at camp than at home, and this drinking could be casual. All these findings seem to indicate that self-reported drinking status is a reliable and consistent measure of drinking behavior.

[Table 1 about here]

The validity of self-reported drinking status is further supported by the consistent results presented in Table 2. These figures show that regular drinkers are more likely than occasional drinkers to keep alcoholic beverages at home and to feel social pressure from relatives, friends or other workers to drink when they prefer not to. Further, far more regular drinkers expressed a general approval of drinking (75%) than either occasional drinkers (40%) or nondrinkers (27%).

[Table 2 about here]

Drinking in the Home Community and at Camp

In this part of the analysis, drinking in the home community will be compared with drinking in the migrant camp. Overall, both regular and occasional drinkers tend to drink more frequently at camp than in the home community (see sections 1 and 2 of Table 1). When drinking patterns between these two places are further examined in Table 3, it becomes apparent that proportions of migrant farmworkers who have changed from infrequent to frequent drinking (as shown in the upper diagonal of Table 3) are much greater than those who have changed in the reverse direction (shown in the lower diagonal of Table 3). These findings clearly imply that camp life may be conductive to heavier drinking.

[Table 3 about here]

Statistics in Table 4 provide some evidence that camp isolation and long working hours may strongly influence drinking behavior: more than 60% of migrant farmworkers who worked more than nine hours a day reported that they were regular drinkers, in contrast to 39% of those who worked less than eight hours daily; migrant farmworkers who live near a liquor store are more likely to be regular drinkers than those who live farther away (73% vs. 47%). However, it is surprising to find that long-term migrant farmworkers are less likely to be regular drinkers than recent migrants (see section 3 of Table 4). Further, only a quarter of migrant farmworkers in our sample felt pressured to drink and those who reported being pressured are not necessarily more likely to become regular drinkers (as indicated by the nonsignificant relationship shown between pressure to drink and drinking status in Table 4). These findings seem to reject our hypothesis that there is a strong norm for a higher level of drinking in migrant camps. Frequent drinking among some migrant farmworkers may simply reflect individual behavioral responses to long working hours and dull camp life.

(Table 4 about here)

A Logistic Regression Model

After examining the drinking patterns in the home community and at camp, determinants of the migrant's drinking status will be analyzed within the context of a logistic regression model. The logistic multiple regression model may involve a single binary (0,1) dependent variable or an ordinal dependent variable (0,1,2...K). In the latter case, the ordinal dependent variable represents different levels of the same response reflecting the same basic mechanism. For instance, the migrant's drinking status (0 = nondrinker, 1 = occasional drinker and 2 = regular drinker) only reflects different degrees of drinking involvement but does not imply an interval scale of differences between categories. Since the logistic regression model has far fewer assumptions than the linear discriminant model (for example, no multivariate normality assumption for covariates), logistic regression is often preferred over discriminant analysis (Harrell, 1986).

The independent variables, derived from the theoretical framework discussed earlier, include one demographic variable (age), two social support variables (martial status and family members present at camp), three socialization variables (sex, ethnic origin and parents' drinking status) and four work-related variables (years worked as farmworkers, average number of hours worked per day, whether respondent felt pressure to drink, and camp distance to liquor store). Results of the logistic regression model are presented in Table 5.

The model clearly indicates that cultural background is certainly an important factor in explaining drinking behavior: compared with the reference group (the omitted category in the regression -- "others," including whites, Filipinos and other Hispanics), Haitians tend to be much less likely to become regular drinkers but other ethnic groups show no significant differences. This finding is further supported by detailed data: among the six major ethnic groups surveyed in our sample, over 90% of Puerto Ricans, Jamaicans and others, 88% of blacks and 67% of Mexicans are either regular drinkers or occasional drinkers, while about 77% of Haitians are nondrinkers. The drastic contrast in drinking status between Haitians and other ethnic groups may reflect differences in the cultural norms that regulate drinking behavior, for example, most of the Haitians came from rural areas in Haiti, have been hard workers, and have brought with them the strong work ethic, national pride, and family values rooted in their culture. Further, they have rebuilt their social networks based on cooperation and ritual ties by becoming godparents to each other's children, duplicating the traditional extended family structure of rural Haiti

(Chierici, 1988-89). The strong social support received from this network may reduce substantially the need to use alcohol as an escape mechanism.

The model also shows that parents' drinking status is one of the important determinants of variation in drinking among migrant farmworkers. Those whose parents were regular drinkers are more likely to become drinkers themselves. Male migrant farmworkers are more likely to consume alcohol than their female counterparts. This relationship is also reflected in the cross-tabulation data: 62% of male migrant farmworkers and 11% of their female counterparts are regular drinkers while about 55% of female migrants and 16% of male migrants are nondrinkers.

The social support variables, marital status and family members present at camp, are highly correlated with drinking status. Married migrants are far less likely to be regular drinkers than those who are single, separated, divorced or widowed (all classified as "others" in the model). Migrant farmworkers having family members living with them in the camp (e.g., for the married, spouse and children; for the nonmarried, siblings and parents) are also less likely to be drinkers. These two findings suggest that the social support and emotional comfort provided by spouse and other family members may significantly decrease the need for drinking and that family members also may reduce drinking by exerting social control on the drinker.

Although three of the four work-related variables were significant in the bivariate analysis (see Table 4), none of them is significant in the multivariate model. This finding seems to imply that in a multivariate framework work-related variables are less important than socialization and social support variables in explaining variation in drinking among migrant farmworkers. Since most of the migrant farmworkers in our sample were engaged in the same low status occupation and were living in similar camps, these work-related variables were less likely to differentiate variation in alcohol consumption among a relatively homogeneous population. However, work-related variables could be significant factors in explaining drinking variation between different occupational groups.

Finally, the model indicates that there is no significant difference in self-reported drinking status among various age groups.

Conclusions and Implications

Farm work during the harvest season is very demanding and often unpredictable, and camp life is very dull and isolated (Friedland and Nelkin, 1971). For these reasons, it is not surprising that drinking is a major social activity in and around migrant camps in our New York study area (Tables 1 and 3). Drinking has been identified as both a positive and negative activity. On the positive side, drinking generates group socializing among individuals and crews in a camp. On the negative side, drinking tends to become a substitute for other recreational activity, a way to kill time and a replacement for social interaction. It may also be a way of self-medication leading to dependency and abuse over a long period of time. However, our study indicates that long-term migrant farmworkers are less likely to be regular drinkers than recent migrants (Table 4), that only a quarter of respondents in the sample felt pressured to drink and those who reported being pressured are not necessarily more likely to become regular drinkers (Table 4). These findings seem to imply that, unlike the situation of longshoremen, a strong drinking subculture has not been formed among migrant farmworkers in Orange County. One obvious implication of this conclusion is that alternative recreational activities for weekends and other free time should be available. In an earlier study of migrant mental health (Chi, 1986), it was found that migrant farmworkers who engaged in community volunteer work tended to have a higher level of subjective well-being. Therefore, organized community volunteer work during weekends may be another viable substitute for drinking.

The descriptive statistics in Tables 1 and 3 indicate that both regular and occasional drinkers tend to drink more frequently in the migrant camp than in the home community; evidently, camp life seems to be conducive to heavier drinking. However, the occupational structure of agricultural production may be the fundamental cause since "public policy in the United States has been tolerant of lower employment standards in agriculture" (Mamer, 1984). Unlike industrial situations, migrant farmworkers do not have paid vacations and the risk of time lost due to weather delays or equipment breakdown is not assumed by the employer--the farmworker pays for lost time by earning less, particularly through the piece-rate system (Fujimoto, 1969). The recently passed Immigration Reform Act, which would penalize farm owners for use of undocumented aliens, may potentially increase the wage scale for domestic and legal immigrant farmworkers. At the sametime, direct importation of fruit and vegetable produce from Mexico, Chile and other Latin American countries may depress the demand for higher wages. An alternative strategy, in contrast to depending on immigration policy to protect domestic workers, is a policy of investment in human capital. Various educational and training programs will make migrant farmworkers more health-conscious and more economically productive. Special assistance is also needed to help them obtain nonagricultural jobs during off-harvest seasons.

The multivariate model presents two important results. First, sex and ethnic origin of a migrant farmworker are highly related to his/her drinking status; second, when his/her parents were regular drinkers, he/she was more likely to become a regular drinker. These findings clearly indicate that drinking is learned social behavior, starting from socialization within the family. A clear message from a health promotion program for migrant farmworkers would be: "Moderation in drinking not only benefits your own health but also improves your children's future well-being."

At the time of the study, Orange County's migrant health services consisted of a small rural satellite facility for farmworkers in Goshen, two community health services clinics in Middletown and Newburgh and referrals to the hospital nearest the larger camps, St. Anthony's in Warwick.

The small satellite health facility in Goshen provides the most accessible and direct medical services for farmworkers and their families. Because this facility is located near the Farmworkers Community Center, clients may be screened and referred to counselors and social service programs offered through the center. During the season, this center runs a major recreation program for rainy days and evenings that provides alternative activities to routine camp life. The center supports Alcoholics Anonymous groups in Spanish and English for farmworkers. The center also runs general education programs on health prevention, work safety, safe sex, drug use and substance abuse. Staff from the Newburgh clinic who find workers with drinking problems while conducting hypertension screening in the camps also make referrals to the community center programs.

It seems logical to reinforce the links between existing health facilities and the Farmworkers Community Center. Extending the center's programs to reach the camps directly, especially for workers with limited access to transportation, would be a more effective way to provide health education and services related to alcohol problems. As noted in this study, social support networks are a key to modifying drinking behavior. By taking programs to the camps, Farmworkers Community Center is better able to reach workers and their drinking companions as well as to influence both the family and the types of social activities planned for weekends and after work. By being exposed to information on the long-term impact of excessive drinking on health, farmworkers may come to associate alcohol use with it undesirable consequences for personal health, job performance and work safety.

References

Caetano, R. (1984). "Ethnicity and drinking in Northern California: A comparison among whites, blacks and Hispanics." Alcohol and Alcoholism, 19(1), 31-44.

Caetano, R. (1987). "Acculturation and drinking patterns among U.S. Hispanics," British Journal of Addiction, 82, 789-799.

Chi, P.S.K. (1985). "A note on sampling migrant farmworkers." The Rural Sociologist, 5, 158-162.

Chi, P.S.K. (1986). "Variation in subjective well-being among black migrant farmworkers in New York." Rural Sociology, 51(2), 183-198.

Chierici, R. (1989). "Haitian farmworkers: An example of migrant marginality." The Connection, Department of Human Development and Family Studies, Cornell University, 4-5.

Clark, W.B. (1982). "Frequency of drunkenness in the U.S. population." Journal of Studies on Alcohol, 43(11), 1267-1275.

Friedland, W.H. and Nelkin, D. (1971) Migrant Agricultural Workers in America's Northeast, New York: Holt, Rinehart and Winston.

Fine, M., Akabas, S.H. and Bellinger, S. (1982). "Cultures of drinking: A workplace perspective." Social Work, 27(5), 436-440.

Fujimoto, I. (1969). "Mechanization and farm labor: Inequities and social consequences," in B.F. Cargill and G.E. Ross-Miller (eds.), Fruit and Vegetable Harvest Mechanization, East Lansing, Michigan, Rural Manpower Center, Michigan State University, 331-340.

Gilbert, M.J. and Cervantes, R.C. (1986). "Patterns and practices of alcohol use among Mexican Americans." Hispanic Journal of Behavioral Sciences, 8(1):1-60.

Glynn, R.J., LoCastro, J.S., Humos, J.A. and Bosse R. (1983). "Social contexts and motives for drinking in men." Journal of Studies on Alcohol, 44(6), 1011-1025.

Gordon, A.J. (1985). "Alcohol and Hispanics in the Northeast: A study of cultural variability and adaption," in L.A. Bennett and G.M. Ames (eds.), The American Experience With Alcohol: Contrasting Cultural Perspectives, Plenum Press, 306-313.

Harrell, F.E. (1986). "The logistic procedure," in SAS User's Group International (ed.), SUGI Supplemental Library User's Guide, Gary, NC: SAS Institute Inc., 269-293.

Hitz, D. (1973). "Drunken sailors and others: drinking problems in specific occupations." Journal of Studies on Alcohol, 34(2), 496-505.

Kunitz, S.R., Lynch, R. and Morales, R. (1983). Alcohol Use Among Migrant Laborers. Albany, New York: New York State Health Research Council.

Linsky, A.S., Colby, J.P. and Strauss, M.A. (1987). "Social stress, normative constraints and alcohol problems in American states." Social Science and Medicine, 24(10), 875-883.

Mamer, J.W. (1984). "Occupational structure and the industrialization of agriculture," in R.D. Emerson (ed.), Seasonal Agricultural Labor Markets in the United States, Ames, Iowa, The Iowa State University Press, 300-301.

Marden, P.G. (undated). A Procedure for Estimating the Potential Clientele for Alcoholism Service Programs, Rockville, Maryland: Division of Special Treatment and Rehabilitation, National Institute of Alcohol Abuse and Alcoholism.

Markides, K.S., Krause, N. and Mindes DeLeon, C.F. (1988) "Acculturation and alcohol consumption among Mexican Americans: A three-generation study." American Journal of Public Health, 78(9), 1178-1181.

Mars, G. (1987). "Longshoremen drinking, economic security and union politics in Newfoundland," in M. Douglas (ed.), Constructive Drinking, New York, Cambridge University Press, 91-101.

Mulford, H.A. (1964). "Drinking and deviant, U.S.A., 1963," Quarterly Journal of Studies on Alcohol, 25(1), 634-650.

Neff, J.A., Hoppe, S.K. and Perea, P. (1987). "Acculturation and alcohol use." Hispanic Journal of Behavioral Sciences, 9(2), 151-181.

The President's Commission on Mental Health (1978) Task Panel Reports: Migrant and Seasonal Farmworkers, Washington, DC:, U.S. Department of Commerce, National Technical Information Service, PB-279816, 1212.

Prus, R. (1983). "Drinking as activity." Journal of Studies on Alcohol, 44(3), 460-475.

Seeman, M. and Anderson, C.S. (1983)."Alienation and alcohol: The role of work, mastery and community in drinking behavior." American Sociological Review, 48:60-77.

Seeman, M., Seeman, A.Z. and Budros, A. (1988). "Powerlessness, work and community: A longitudinal study of alienation and alcohol use." Journal of Health and Social Behavior, 29(3), 185-198.

Siassi, I., Crochetti, G. and Spiro, H.R. (1973). "Drinking patterns and alcoholism in a blue-collar population." Quarterly Journal of Studies on Alcohol, 34(3), 917-926.

Smart, R.G. (1979). "Drinking problems among employed, unemployed and shift workers." Journal of Occupational Medicine, 21(11), 731-736.

Trotter, R.T. (1985) "Mexican American experience with alcohol: South Texas examples," in L.A. Bennett and G.M. Ames (eds.) The American Experience With Alcohol: Contrasting Cultural Perspectives, New York: Plenum Press, 279-296.

Wlodarczk, P.A. (1979). Alcoholism Services for Migrant and Seasonal Farmworkers (Master's Thesis). New Haven, Connecticut Public Health School, Yale University.

Table 1: Patterns of Drinking Among Migrant Farmworkers (column percent)

Characteristics	Drinking Status		
	Regular Drinkers	Occasional Drinkers	Non-Drinkers
1. Frequency of drinking in the home community			
Few times a year	16.43	35.99	100.0
1 or 2 times a month	13.02	19.26	-
Weekends and holidays	45.90	31.07	-
1 or 2 times a week	11.86	5.62	-
Daily	12.79	8.06	-
N	123	53	1
Not applicable or no response	4	4	52
2. Frequency of drinking at camp.			
A few times a year	9.24	29.97	-
1 or 2 times a month	7.40	16.77	-
Weekends and holidays	51.91	20.57	-
1 or 2 times a week	16.54	20.09	100.0
Daily	14.92	12.60	-
N	125	50	2
Not applicable or no response	2	7	51
3. How many drinks at a time?			
One drink or beer	9.13	47.59	-
A couple of drinks or beers	30.52	29.35	100.0
A six-pack	6.12	6.49	-
About a pint	8.60	5.93	-
About a quart	6.53	4.24	-
More than a quart	39.10	6.41	-
N	124	49	2
Not applicable or no response	3	8	51

Table 2: Drinking Related Variables by Drinking Status
(column percent)

Variables	Drinking Status		
	Regular Drinkers	Occasional Drinkers	Non-Drinkers
1. "Do you keep alcohol around the house in your home community?"			
No	66.20	74.50	100.0
Yes	33.80	25.50	-
N	127	55	13
Not applicable or no response	0	2	40
2. "Do you generally approve of drinking?"			
No	27.26	60.07	72.76
Yes	72.74	39.93	27.24
N	125	57	47
Not applicable or no response	2	0	6
3. "Do you ever feel social pressure from relatives, friends, or other workers to drink when you prefer not to?"			
No	69.13	81.54	81.80
Yes	30.87	18.46	18.20
N	127	57	51
Not applicable or no response	0	0	2

Table 3: Relationship Between Drinking in the
Home Community and
Drinking at Camp
(column percent)

	Frequency of Drinking in the Home Community					
Frequency of drinking at camp	Daily	1 or 2 times a week	Weekends & holidays	1 or 2 times a month	Few times a year	Never
Daily	76.19	16.67	3.66	10.0	4.88	50.0
1 or 2 times a week	9.52	55.56	14.63	10.0	12.20	0.0
Weekends and holidays	14.29	16.67	64.63	30.0	24.39	0.0
1 or 2 times a month	0.0	0.0	4.88	36.67	12.20	50.0
Few times a year	0.0	0.0	3.66	10.0	31.71	0.0
Never	0.0	5.56	6.10	0	12.20	0.0
N	21	18	82	30	41	2

Table 4: Relationships Between Drinking Status and Work-Related Variables (Row Percent)

	Drinking Status			
	Regular Drinkers	Occasional Drinkers	Non-Drinkers	N
(1) Average Number of Hours Worked Per Day Last Week[1]				
0-7	39.28	38.44	22.28	50
8-9	55.33	19.78	24.89	83
10-13	63.03	19.17	17.80	94
(2) Camp Distance to Liquor Store[2]				
Nearby	72.66	21.20	6.14	25
Close	59.58	23.17	17.25	68
Far Away	47.42	24.93	27.65	145
(3) Years Worked as Farmworker[3]				
<3 years	62.28	28.31	9.41	41
3-10	55.93	16.25	27.82	98
11+	47.62	29.91	22.46	99
(4) Does Respondent Ever Feel Pressured to Drink?[4]				
Yes	66.48	17.85	15.66	59
No	49.94	26.45	23.61	176

1. $x^2 = 10.37^*$, C = .21
2. $x^2 = 8.81^*$, C = .19
3. $x^2 = 9.86^*$, C = .20
4. $x^2 = 4.88$, C = .14

C=Contingency Coefficient
* $p<.05$

Table 5: Logistic Regression Analysis of Migrant Farmworkers' Drinking Status

		Standard		
Variables	Mean	Coefficient	Error	χ^2
Alpha 1	--	1.99	1.17	2.91^{*}
Alpha 2	--	.12	1.16	.01
1. Control Variable				
Age	33.41	.01	.02	.44
2. Socialization Variables				
(1) Sex				
Male	.83	1.53	.48	10.29^{***}
Female	--	--	--	--
(2) Ethnic Origin				
Black	.10	1.03	.83	1.52
Haitian	.10	-3.14	.72	19.05^{***}
Jamaican	.08	-.48	.72	.43
Mexican	.29	-.86	.56	2.32
Puerto Rican	.32	.02	.57	0
Others	--	--	--	--
(3) Parents' Drinking Status				
Regular Drinker	.30	.79	.41	3.77^{**}
Occasional Drinker	.38	-.07	.36	.04
Nondrinker	--	--	--	--
3. Social Support Variables				
(1) Family Members Present at Camp				
Yes	.38	-.63	.36	2.96^{*}
No	--	--	--	--
(2) Marital Status				
Married	.55	-.65	.36	3.26^{*}
Others	--	--	--	--

Table 5: (continued)

Variables	Mean	Standard Coefficient	Error	χ^2
4. Work-related Variables				
(1) Years Worked as Farmworker	12.40	-.01	.02	.53
(2) Average Number of Hours Worked Per Day Last Week	8.76	-.06	.08	.67
(3) Does Respondent Ever Feel Pressured to Drink?				
Yes	.024	.09	.40	.05
No	--	--	--	--
(4) Distance to Liquor Store				
Nearby	--	--	--	--
Close	.29	-.11	.59	.04
Far away	.60	-.14	.55	.06

Dependent Variable - Drinking Status:

Regular Drinker	= 2	(N=120)
Occasional Drinker	= 1	(N=53)
Non-drinker	= 0	(N=37)

-2 Log Likelihood = 355.61

Model χ^2 = 112.65 with 16 D.F.

*P<.08 **P<.05 ***P<.01

Medical Utilization Patterns

Medical Utilization Patterns of Migrant Farmworkers in Wayne County, New York

By

Peter S.K. Chi

Printed in Public Health Reports, 100(5), 1985

Abstract

A representative sample of 218 Migrant farmworkers was randomly drawn in Wayne County, New York, during the summer of 1982. Three distinct migrant groups were identified: immigrants, recent migrants, and long-term migrants. Medical utilization patterns, including physician visits and use of medical services in the community health center, were compared among the three migrant groups. The determinants of physician visits were examined in a multiple regression model.

The focus was also placed on types of health problems for which medical treatment had been delayed, and the reasons for the delay were clearly identified. Furthermore, this study examined migrants' subjective assessment of quality of health care in the community.

The results of this study indicate that the provision of comprehensive health programs, removal of structural barriers in the health delivery system, and a program of migrant health education are the necessary steps to alter the medical utilization behavior of migrant farmworkers.

Introduction

Although migrant farmworkers have attracted considerable attention among researchers in recent years, the subjects of health care and health status as related to this group have not been systematically studied. In the Northeast, the large majority of previous studies of migrant workers have focused primarily on migration streams and characteristics of migrants (1-3).

Studies of migrant health care in other regions can generally be characterized into two types. The first type tends to center around providers of health services and comparisons of the relative quality, coverage, and costs of medical services between migrant clinics and private physicians (4-7). The second type focuses on the medical utilization patterns of migrant farmworkers (8-9). Some of these studies are descriptive in nature, and their empirical data have been based on nonrepresentative samples. Consequently, few multivariate models of migrant medical utilization patterns have been constructed. Furthermore, the relative importance of significant factors in relation to utilization behavior has not been systematically ascertained.

Since little systematic analysis of migrant health care has been undertaken, a brief review of general health literature may provide a foundation for the design of a multivariate study of the medical utilization patterns of migrant farmworkers. For the general population, three major approaches have been followed to explain the complicated relationship between various determinants and the utilization of health services. The first approach, a social-psychological perspective, suggests that utilization behavior is primarily a function of knowledge and perceptions of vulnerability to disease, severity of a health problem, perceived benefits, and barrier to taking action. This approach uses social and behavioral attributes to predict individual utilization behavior (10-15). Furthermore, the psychological and cultural makeup of different racial and ethnic groups is considered to have a major influence on their use of health services (16-22).

The second approach, a resource and opportunity perspective, claims that utilization behavior is largely a result of the availability and accessibility of health services. This approach emphasizes the structural or contextual variables derived from organizational, economic, and ecological frameworks. It attempts to establish functional relationships between ecological distance, economic costs, community resources, and the recipients of health services (23-27). In support of this perspective, a few studies specifically indicate that differences in utilization behavior tend to disappear when access to health services is substantially improved for disadvantaged groups. (15,28-30).

The third approach takes a holistic perspective that synthesizes the principal features of the other two approaches. In this approach, utilization behavior is a joint function of individual attributes and organizational factors. The holistic perspective emphasizes that health care study should be conducted with explicit concern for the economic, ecological, and organizational contexts in which individual utilization behavior takes place (31-37).

Because of its comprehensiveness, the holistic approach has been followed in this paper. The paper's major purpose is to determine the significant factors affecting use or nonuse of health services among migrant farmworkers.

Data

This study is based on data obtained from the New York Migrant Health Interview Survey conducted in Wayne County, New York, in the summer of 1982. In order to obtain a representative sample of migrant farmworkers from which to collect health statistics and related information, a special sampling procedure was designed for this survey. The first step was to compile a comprehensive list of addresses for all migrant camps and other migrant housing units in Wayne County. All units on the list were stratified according to the size of maximum capacity. The total number of migrants that could be accommodated in each size category was known. A representative sample of 218 migrants was randomly drawn through a three-stage sampling procedure from all size categories (the sample size was determined by budget constraints). Special efforts were made on October 21, 1982, to find out from owners of migrant camps and other housing units how many migrant workers were actually living in the units. On the assumption that the sample migrants had characteristics similar to those of migrants enumerated on

October 21, the interviewed migrants can be considered a representative sample of total migrant workers in Wayne County on that day. The detailed sampling procedure has been described elsewhere (38).

During the 1982 migrant health survey, seven Cornell undergraduate students were hired as interviewers, and one graduate student as project coordinator. All the interviewers had some survey experience through course work in field studies or in research methods. They were also trained in special sessions designed for the migrant project. The project coordinator assigned sampled camps or housing units to interviewers and supervised their daily interview activities. Before the actual interviewing began, the coordinator sent letters to local growers, requesting permission for the interviewers to enter farms and to interview randomly selected migrants.

The survey instrument contained 113 items, covering the migrant farmworker's individual and family characteristics, his or her health habits and attitudes, health status, utilization of health services, home community characteristics, and the physical environment of the current residence. Just before the scheduled interview period, a preliminary test of the questionnaire was conducted among 10 migrant farmworkers in the county, and appropriate revisions were made.

Socioeconomic Characteristics

Wayne County is one of the leading areas of central New York in the production of apples, peaches, and other fruits. Harvesting and processing these crops depend largely on the seasonal migration of farmworkers. Of the 218 migrant farmworkers in our sample, 167 were born in the United States. In other words, 76.6 percent of the total sample were native-born Americans. Of the remaining 51 respondents, 44 percent reported that they were naturalized American citizens. Only 29 were either unnaturalized permanent residents of the United States or illegal aliens.

Although all migrant farmworkers usually engage in similar farm work (harvesting fruits in the field or processing fruits in the canning plant), they are not a homogeneous social group. Previous studies have found that black American migrant farmworkers differed from black immigrants in work conditions, work attitude, work productivity, and mobility opportunities (1,39-41).

In our Wayne County survey, three distinct migrant groups were identified. The first group consisted of immigrants from Puerto Rico or from other countries (mostly Haiti and Jamaica); the second group, recent migrants, included native-born farmworkers who had made seasonal migrations to New York State for less than three years; and the third group, long-term migrants, was composed of those native-born farmworkers who had made a seasonal migration to New York State for three or more years. Table 1 shows the distribution of selected socioeconomic characteristics for these three groups.

The data indicate that recent migrants were significantly younger and had a higher educational level than long-term migrants. The former group had a higher proportion of single persons and had worked a shorter period of time as migrant workers than the latter group. In the immigrant group, more than 90 percent were male, and this group had the lowest educational level of the three groups.

Besides these differences, four additional observations are particularly worth pointing out. First, respondents in our sample had worked an average of 13.2 years as farmworkers, and also had worked for more than four years for the same employer. This persistent work history suggests that migrant farmworkers, particularly long-term migrants who on the average had worked 7.24 years for the same employer, are loyal workers in agriculture and should be considered an integral part of the community rather than be treated as drifters. Second, more than 48 percent of the immigrants were married (the highest proportion among the three groups); a large proportion of them had left their families at home and worked alone in New York. Third, since more than 95 percent of the sample were blacks, no significant difference in racial composition was found. Fourth, no significant differences in average weekly wages and annual household income were found among the three groups (both F and X^2 are not significant). All groups earned the same level of average weekly wages in 1982 (around $212) and had similar annual household incomes in 1981. (Mean annual household income for the sample was $5,327, and more than 60 percent of all migrant households earned less than $6,000.) Although these migrant groups have similar economic status and racial composition, they are quite distinct in other social and demographic characteristics. Therefore, migrant status (the classification of three migrant groups) will be a key variable in this study of the medical utilization patterns of migrant farmworkers.

Diagnostic and Preventive Medical Care

The migrant farmworkers were asked to give information about their use of professional health care services and facilities, including visits to dentists and physicians and overnight stays in hospitals. In this section, visits to physicians will be analyzed in a multivariate model. The dependent variable is number of visits to a physician's office or clinic during the past 12 months. The physician visits reported here included not only physical examination or immunization but also some visits for illness in which patients were given injections, X-rays or medical tests. This question was designed to reflect the extent of diagnostic and preventive medical care.

In the health literature, the independent variables used to predict utilization of health services have been broadly categorized into three dimensions: need for care, predisposition to use health services, and enabling factors (33,42-45). The first dimension, need for care, represents the most important concern affecting a person's likelihood of seeking medical care. It is usually measured by individually perceived symptoms of an illness, the person's response, and evaluation of the illness's disabling effects, or by medical assessment of health status and physician-rated urgency of the condition. In this study, the respondent's self-assessed health status two years ago is used to measure this dimension. It was hypothesized that the lower the health status two years ago, the more likely the migrant would be to visit a doctor for diagnostic and preventive care.

The predisposition to use health services, the second dimension, may be influenced by sociological and demographic variables such as age, sex, race-ethnicity, education, religion, and family size and composition. It may also be affected by psychological variables, including attitudes and beliefs related to health care and skepticism about the value of health services or the medical profession. In this study since more than 95 percent of respondents are blacks, race is not included as an independent variable. Age, sex, marital status, and educational level are the typical predisposing variables and are treated as independent variables in our model. One unique variable, migrant status, represents membership in one of the three distinct migrant groups. Since, as indicated in the previous section, these migrant groups are quite heterogeneous in sociological and demographic characteristics, it is appropriate to include migrant status in a multivariate analysis. Responses to the several psychological questions on health attitudes and beliefs asked in the survey were not used in the model because these responses reflected current psychological conditions. It is not logical to predict visits to physicians over the past year on the basis of current attitudes, because current attitudes may be affected by earlier behavior.

The hypothesized relationships between these predisposing variables and the dependent variable are presented in Table 2. Since migrant status has never been used in previous studies, some additional discussion on this variable is needed. Of the three migrant groups, long-term migrants were chosen as a reference group for comparison; this group was the omitted category in the regression analysis. Since immigrants had the lowest educational level and were predominantly male (Table 1), their level of visits to physicians was hypothesized to be lower than that of long-term migrants. Recent migrants had a higher level of education than long-term migrants (Table 1); they might therefore be expected to have a higher level of visits to physicians. However, recent migrants were also significantly younger (Table 1) than long-term migrants, so their need for diagnostic and preventive care might be less. As a result of these two opposing forces, it was hypothesized that the level of visits for recent migrants would not be significantly different from that of long-term migrants.

The third dimension, enabling factors, reflects the conditions that may either facilitate or impede a person's decision to seek health care. These factors include family or individual resources (income and health insurance coverage), accessibility of health services (knowledge about health services, time and distance to health facilities), and characteristics of the health care system (methods of financing and organizational types of health providers). In this analysis, household income, presence of Medicaid or other insurance, and knowledge about the health center in Wayne County are the selected enabling factors. All these variables were hypothesized to have a positive relationship with visits to physicians.

Detailed measures of all dependent and independent variables used in the model are presented in Table 2. The method of analysis used in this study is the ordinary least squares (OLS) multiple regression. The relative importance of significant independent variables is determined in terms of standardized partial regression coefficients (beta weights).

Table 3 reports the frequency distribution of the dependent variable, physician visits, by migrant status. Among the three migrant groups, long-term migrants tended to use medical services most frequently (more than 44 percent had visited physicians or clinics two or more times during the past year). Among nonusers, recent migrants had the lowest proportion (28 percent) while immigrants had the highest (51 percent).

Table 4 shows the results of the multiple regression analysis on diagnostic and preventive medical care for migrant farmworkers. Of the 10 independent variables, three were significantly related to variation in number of visits to physicians.

First, female migrants visit physicians more frequently than their male counterparts. The same sex differential in medical utilization patterns has been consistently found in previous studies (42,46). Second, immigrants visited physicians significantly less than long-term migrants (the omitted dummy category in the equation). This finding may indicate the general ignorance of the preventive health concept among immigrants; they usually called upon the medical profession only when their symptoms of illness reached crisis proportions. It may also reflect the fact that many immigrants lack knowledge of the local health service facility (Table 5). Furthermore, some Caribbean immigrants may prefer folk medicine to modern medical treatments because of their unique cultural and religious traditions (47,48). As hypothesized, no significant difference was found between recent migrants and long-term migrants in seeking diagnostic and preventive medical care. Third, having Medicaid insurance increased the likelihood of migrant farmworkers' visiting physicians for diagnostic and preventive health care, because Medicaid usually provides full payment of medical expenses. This finding is consistent with the findings of previous studies, in which Medicaid coverage was associated with increased use of health services in the general population (49). Of these three significant variables, the most important one related to visits to physicians is migrant status (it has the highest beta weight, 0.216), followed by Medicaid insurance. (0.183) and sex (0.156).

Delay in Medical Care or Treatments

An important aspect of medical care is prompt attention to existing health problems. Respondents were asked about types of health problems for which medical treatment had been postponed and reasons for the delay in seeking medical help (both questions were open-ended). Table 6 indicates that more than 40 percent of all migrant farmworkers in the sample put off receiving some kind of medical care or treatment for an existing health problem. Among those who delayed medical care or treatment, 53 percent of recent migrants and more than 60 percent of long-term migrants reported delay in having dental work done, while 35 percent of immigrants postponed medical care for a variety of health problems, such as anemia, arthritis, blood in stools, high blood pressure, broken bones, cataracts, colds, headaches, nervousness, hernia, stomach ulcers, muscle contractions, and so on. (All of these problems were grouped together as "others" for the analysis.) Twenty-three percent of immigrants and 21 percent of recent migrants reported that they put off treatments for a combination of medical problems, the most common of which were "eyes and dental work," "chest pains, colds and headaches." A relatively high proportion of immigrants (19 percent) indicated delaying regular physical checkups.

Among reasons for delaying medical treatments, lack of time was the most important for immigrants (57 percent). More than 77 percent of recent migrants and 50 percent of long-term migrants cited both time and economic costs as reasons. It is interesting to note that one-quarter of all migrant farmworkers expressed fear of the medical profession or disbelief in it as a reason for not seeking medical services.

Statements made by some of the respondents are quite illuminating: "I am afraid of dentists," "Don't believe in doctors," "Don't like needles," "Don't like being cut into." These negative attitudes toward physicians and medical treatments were particularly strong among long-term migrants because they were older and less educated. Lack of accessibility, such as "no transportation," "poor communication with nurses," and "Difficult to get an appointment," was also consider by many migrants (particularly immigrants and long-term migrants) as a barrier that prevented them from utilizing medical services.

Health Care in Wayne County

A special migrant health center was established in the town of Sodus some years ago, the only program in Wayne County. Its services were originally directed toward migrant farmworkers and their families. Later, the U.S. Department of Health and Human Services decided to integrate its migrant health program with its community health program (50). At the time of this study, the Sodus health center had been changed into a full-scale community health center and its services extended to the general population. Since the center continued to receive both migrant and community health funds, migrant farmworkers who sought medical care in the center needed to pay only a reduced rate ($3 per visit).

In our study, respondents were first asked whether they knew that a community health center existed in Wayne County. For those who did know, a second question was asked: "Have you or any of your household members ever used the medical services in the center during the past 12 months?" If the answer was positive, the respondent was asked to rate his or his family's experience with the center. The results of these questions are presented in Table 5.

The data show that long-term migrants, as might be expected, were more knowledgeable about the center's existence than the other two groups, while immigrants were the least informed group. Of those who had knowledge about the community health center, more than 60 percent of long-term migrants or their family members had used the medical services of the center during the last year, but only one-third of immigrants had done so. Although the three migrant groups had different levels of knowledge and utilization of health care in Sodus Community Health Center, most migrants who has used the center's medical services rated their experience favorably, and no significant differences were found among the migrant groups in their assessment of medical services received from the center (Table 5).

Discussion

A representative sample of 218 migrant farmworkers was randomly drawn in Wayne County, New York during the summer of 1982. Number of visits to physicians for diagnostic and preventive medical care was analyzed in a multivariate model. The results indicate that migrant status is the most important variable to explain variations in visits to physicians among migrant farmworkers. Specifically, immigrants had a significantly lower level of visits than long-term migrants, while recent and long-term migrants had similar utilization patterns (Table 4).

Although the general health literature suggests that marital status, education, and income may be the best predictors of utilization, these variables did not have any significant effect on migrants' level of visits to physicians in our model. This unexpected finding may result from two factors. First, most of the respondents in our sample has a similar level of income (Table 1) and were very homogeneous in economic background. Second, since migrant status reflects significant differences in age, martial status, and education (Table 1), the strong effect of migrant status on physician visits may have reduced the explanatory power of these traditional predisposing variables. In order to test this hypothesis, four interaction terms (immigrant X age, immigrant X education, recent migrant X age and recent migrant X education) were added to the multiple regression model in a separate computer run. No statistical significance was found between these interaction terms and the dependent variable. Therefore, they were not included in the final model.

The model also indicated that Medicaid insurance had a significant positive effect on number of visits to physicians. It is reasonable to expect that an increase in visits to physicians may increase the probability of solving many untreated medical problems. Given the linkage between having Medicaid insurance, frequency of visiting physicians, and reduction of medical problems, however, the medical utilization patterns of migrant farmworkers cannot be expected to improve spontaneously, since less than 12 percent of migrants in our sample were covered by Medicaid insurance. Comprehensive health insurance coverage for all migrant farmworkers, either under Medicaid or other well-designed programs, would be an important factor in making medical services available to them.

Another significant finding from the regression model is that visits of migrant farmworkers to physicians vary with sex: female migrants tended to visit doctors more than their male counterparts.

Based on the different patterns of visits to physicians found between men and women and between immigrants and native-born migrants, we may conclude that diagnostic and preventive medical care is

114

particularly needed for male migrant farmworkers in general and immigrants in particular. Data in Table 6 also indicated that dental care has been generally neglected by a large proportion of native born migrants. Finally, the results in Table 5 showed that immigrants were least informed about the community health center and were less likely than other migrant groups to use its services. These findings provide public health professionals with an empirical basis to identify the target population for specific health service programs.

Although the multivariate model in general is significant in explaining variations in visits to physicians among migrant farmworkers (F = 2.175), the explained variance of the dependent variable is relatively low (adjusted $R^i = .0708$). The low R^2 may be attributed to the generally low level of physician visits by migrant farmworkers, which would allow little variation for explanation in the first place. The highly homogeneous racial and economic background among our respondents may also have reduced the explanatory power of many of the independent variables.

Future migrant health studies should be extended to include other counties (such as Orange County, New York) in which Hispanic migrants are centered, so that racial and ethnic makeup may be used as a key independent variable in explaining medical utilization patterns. Further, information on medical utilization should be collected in a longitudinal study. Measures of need for health care and responses to psychological questions on health attitudes and beliefs should be obtained prior to collecting data on visits to physicians so that such antecedent variables can be incorporated in the multivariate causal model.

The data in Table 6 showed that a substantial proportion of migrant farmworkers cited fear of medical practices and disbelief in the medical profession as reasons for delaying some medical treatments. To change these negative attitudes and perceptions, accurate materials on health care and proper health education programs are urgently needed (51,52). In several ways, the Cooperative Extension services of land grant universities seem to be most appropriate for this task. Historically, they are devoted to public education, and they already enjoy a positive relationship with people and organizations in local areas. They are able to work with all socioeconomic groups and to reach out to migrant farmworkers.

Cooperative extension has considerable expertise in delivering information and in using multiple teaching techniques (53,53). Migrant health education might be linked with existing extension programs, for example, to develop a migrant health education program that involves 4-H youth through extension.

Many respondents reported lack of time and lack of access as reasons for not seeking health care (Table 6). Since migrant farmworkers usually have a busy working schedule in the harvest season, special health services should be provided for them after working hours or during weekends. Appropriate actions to increase accessibility to the medical profession and health care facilities would include providing special transportation for migrant farmworkers who live a long distance from the health center, speeding up medical appointments, shortening waiting time, and promoting communication between the medical profession and migrant workers.

Health care is a continuous process, but the seasonal mobility of migrant farmworkers disrupts that continuity. Medicaid insurance may have the potential to provide continuous health care for migratory farmworkers, but only a small proportion of them (less than 12 percent in our sample) had actually benefitted from the program.

Recent Federal health policy has emphasized the integration of migrant health programs with community health programs. however, jointly funded community health centers throughout the entire country are quite scarce (only 78 such centers were operating in 1979). Also, even though there was a jointly funded health center in our study area and 76 percent of migrant farmworkers knew of its existence, only 53 percent of the total sample had used the center's services in 1981 (Table 5). Moreover, at jointly funded centers, limited attention is being given to matching the level of funding and the level of services for migrants. For example, a recent government study reports that a Florida center had 62 percent of its funding from the Federal migrant health program but that migrants made up only 43 percent of its patient load in 1979 (50).

In order to provide comprehensive and continuous health care for migrant farmworkers, a health voucher system should be considered as an additional method of health delivery. Health vouchers can be offered directly to eligible migrant farmworkers, who may use the vouchers to purchase health services not only from migrant health centers and community health centers but also from other health providers in the market. The health providers would be reimbursed by the Federal migrant health fund. Further, migrant farmworkers would be able to use health vouchers whenever and wherever they needed medical care. This system, in principle, would provide migrants with greater freedom to seek continuous health care. Further analysis of this strategy is definitely needed.

In sum, the results of the present study show conclusively that the provision of comprehensive health programs, removal of structural barriers in the health delivery system, and a program of migrant health education are the steps needed to alter the medical utilization behavior of migrant farmworkers.

Table 1. Socioeconomic Characteristics of Migrant Farmworkers in Wayne County, New York, 1982

Characteristics	Total	Immigrants	Recent migrants	Long-term migrants
Age:[1]				
Mean years	34.79	33.97	28.75	38.56
Number of respondents	215	48	66	101
Education:[2]				
Mean years	9.46	7.60	11.32	9.29
Number of respondents	214	47	66	101
Number of years as farmworkers:[3]				
Mean years	13.17	8.02	6.91	19.10
Number of respondents	211	46	65	100
Number of years of farmwork for this employer:[4]				
Mean years	4.68	2.55	1.94	7.24
Number of respondents	215	48	66	101
Weekly wages:[5]				
Mean weekly wage	$212.06	$248.02	$207.19	$191.42
Number of respondents	131	33	36	62
Sex:[6]				
Percent male	76.6	92.09	66.99	74.54
Percent female	23.4	7.91	33.01	25.46
Number of respondents	217	51	60	106
Marital Status:[7]				
Percent single	39.16	31.18	63.30	29.49
Percent married	37.25	48.05	15.27	44.36
Other	23.59	20.77	21.43	26.15
Number of respondents	217	51	60	106
Total household income in 1981:[8]				
Percent earning $0-3,000	31.43	23.35	42.00	29.08
Percent earning $3,001-6,000	34.41	33.48	36.00	33.72
Percent earning $6,001-9,000	21.58	27.00	14.32	23.26
Percent earning $9,001 or more	12.67	16.17	7.68	13.98
Number of respondents	203	46	58	100

[1] $F = 15.4, P < .001$

[2] $F = 25.32, P < .001$

[3] $F = 34.1, P < .001$

[4] $F = 38.46, P < .001$

[5] $F = 2.02, P < .14$

[6] $X^2 = 10.14, P < .01$

[7] $X^2 = 23.54, P < .001$

[8] $X^2 = 7.062, P < .32$

Table 2. Measurements and Hypothesized Relationships Between Dependent and Independent Variables Used in the Regression Analysis of Physician Visits

		Hypothesized
Description of Variables	Measurement	Relationship
Dependent variable		
Physician visits	Number of visits for injections, X-rays, tests, or examinations during past 12 months	
Independent variables		
Predisposition to use health services:		
Age	Range from 18 to 64 years	Positive
Sex	1 = male; 0 = female	Negative
Marital status (one subcategory must be omitted in the equation):		
Single	1 = yes; 0 = no	Negative
Married	1 = yes; 0 = no	Positive
Other	1 = yes; 0 = no	(1)
Education	Highest grade completed in school	Positive
Migrant status (one subcategory must be omitted in the equation):		
Immigrants	1 = yes; 0 = no	Negative
Recent migrants	1 = yes; 0 = no	Negative or Positive
Long-term migrants	1 = yes; 0 = no	(1)
Enabling factors:		
Household income	1981 nominal income in the following categories: 1 = 0-3,000; 2 = 3,001-6,000; 3 = 6,001-9,000; 4 = 9,001-12,000; 5 = 12,001-15,000; 6 = 15,001-20,000; 7 = 20,001-25,000; 8 = 25,001-30,000; 9 = 30,001 or more	Positive
Medicaid	1 = yes; 0 = no	Positive
Other insurance	1 = yes; 0 = no	Positive
Knowledge about the health center in the community	1 = yes; 0 = no	Positive
Need for care:		
Self-assessed health status 2 years ago	1 = worse than today; 2 = same as or better than today	Positive

---

[1] The missing subcategory in the equation will be used as a framework of reference for comparison with other subcategories.

Table 3. Visits to a Physician's Office or Clinic for Injections, X-rays, Tests, or Examinations During the Past 12 Months, by Migrant Status
(Column Percentage)

Number of Visits[1]	Total (N = 210)	Immigrants (N = 49)	Recent Migrants (N = 58)	Long-term Migrants (N = 103)
None	35.15	50.74	27.90	31.79
Once	29.40	33.99	35.26	23.87
Twice	12.95	0.92	17.31	16.25
Three Times	11.82	12.75	6.04	14.65
Four or more	10.68	1.61	13.48	13.45

[1] $X^2 = 21.24$, $P < .01$

Table 4. A Regression Analysis of Diagnostic and Preventive Medical Care for Migrant Farmworkers

Independent variables	Partial Regression Coefficient	Standard Error	t Test	Beta Weight
Predisposition to use health services				
Age	.0047	.0142	.334	
Sex	-.6750	.3271	[1]-2.064	.156
Marital Status:				
Single	-.4689	.3662	-1.280	
Married	-.2948	.3609	-.817	
Other	-	-	-	
Education	-.0104	.0584	-.178	
Migrant Status:				
Immigrant	-1.0210	.3983	[2]-2.563	.216
Recent migrant	-.0783	.3596	-.218	
Long-term migrant	-	-	-	
Enabling factors				
Household income	.1804	.1171	1.541	
Medicaid	1.1174	.4577	[2]2.442	.183
Other insurance	.2701	.3133	.862	
Knowledge about health center	-.2357	.3455	-.682	
Need for care				
Health status 2 years ago	.1371	.3936	.348	
Constant term	2.1485	1.0677	[1]2.012	
Mean (dependent variable)		1.639		
Number		186.0		
R^2 (adjusted)		.0708		
F value		[2]2.175		

---

[1] Statistically significant at 5 percent level.

[2] Statistically significant at 1 percent level.

Table 5. Knowledge and utilization of Community Health Center in Wayne
County by Migrant Status
(Column Percent)

Questions	Total	Immigrants	Recent Migrants	Long-term Migrants
Do you know whether there is a migrant health center in this community?[1] *(number responding)*	*212*	*49*	*59*	*104*
Yes	76.34	54.96	70.86	89.59
No	23.66	45.04	29.14	10.41
Have you or any of your household members ever used the medical services in the center during the past 12 months?[2] *(number responding)*	*171*	*31*	*44*	*96*
Yes	53.35	36.19	49.01	60.76
No	46.65	63.18	50.99	39.24
If yes, how would you rate your experience with the center?[3] *(number responding)*	*91*	*10*	*22*	*59*
Very bad or poor	7.75	7.25	6.49	8.30
Fair	20.75	11.71	6.34	27.62
Good or excellent	71.50	81.04	87.17	64.08

---

[1] $X^2 = 23.61$, $P < .001$

[2] $X^2 = 6.06$, $P < .05$

[3] $X^2 = 5.28$, $P < .25$

Table 6. Delay of Medical Care or Treatments by Migrant Status
(Column Percentage)

Questions	Total	Recent Immigrants	Long-term Migrants	Migrants
Is there some kind of care of treatment that you have put off, even though you may still need it?[1]				
(number responding)	*217*	*51*	*60*	*106*
Yes	41.37	35.39	50.92	38.90
No	58.63	64.61	49.08	61.10
What is this care or treatment for?[2]				
(number responding)	*86*	*16*	*30*	*40*
Dental work	49.59	17.24	52.75	60.10
Eye problems	11.12	5.68	4.87	17.51
Checkup	6.70	19.00	2.60	4.67
Multiple medical problems	12.97	22.92	20.67	3.83
Other	19.62	35.16	19.11	13.88
Why have you put if off?[3]				
(number responding)	*85*	*15*	*30*	*40*
No time	32.83	57.09	40.31	17.90
Cost too much	31.72	17.92	37.37	32.81
Fear or disbelief in medical profession	24.95	12.83	19.10	33.99
Lack of access to medical profession	10.49	12.15	3.19	15.30

[1] $\chi^2 = 3.26, P < .10$
[2] $\chi^2 = 19.82, P < .05$
[3] $\chi^2 = 12.28, P < .05$

Health Characteristics and Utilization of Public Sector Health Facilities Among Migrant Agricultural Workers in Orange County, New York

By

Shelley I. White-Means, Ph.D.

Printed in Journal of Health and Social Policy (Forthcoming, 1992)

Abstract

Publicly subsidized medical clinics were established to provide migrant farmworkers with minimal access to mainstream medical care. Nevertheless, migrant farmworkers delay treatment of health problems and sometimes refrain totally from use of medical facilities. The present study explores the health status and utilization of subsidized migrant clinics by farmworkers in a vegetable production county (Orange County) in upstate New York. Multivariate analysis indicated that economic resources, mental health status, health insurance coverage, language, education and utilization of acute care facilities are important predictors of these decisions.

Introduction

Migrant agricultural farmworkers have typically faced a high risk of debilitating health due to limited access to the medical service sector. The Migrant Health Care Act provides this transient yet indispensable workforce with minimum access to preventive as well as diagnostic and treatment (primary health care) services through subsidized migrant clinics. Numerous researchers have evaluated migrant farmworkers' annual, post-legislation visits to facilities. What is less clear are the factors that influence the workers' utilization of publicly subsidized clinics.

National surveys of medical care utilization seldom include information about this transient workforce. Thus, documentation of the medical utilization patterns for this workforce is typically obtained through personal interviews in small regions (counties or states) where the density of the migrant farmworker population is extensive over a prolonged time period. Nonetheless, researchers have identified consistent patterns of medical visits through information collected from farmworkers in various regions of the country.

In a study of farmworkers in three northern Florida counties, Bleiweis, et al.,[1] found that the use of physician, hospital, public clinic and migrant clinic services during 1973-74 was highly correlated with the presence of acute medical conditions (such as injuries), perceptions of being in poor health and the worker's ability to pay for services. In a study of Hispanic migrant farmworkers in Wisconsin, Slesinger and Cautley[2] found that the annual use of health services was low compared with that of other populations. Older workers and women were more likely to make visits to physicians. On the other hand, language, distance, limited hours of services, and inability to pay represented major barriers.

Similarly, Chi's study[3] of black farmworkers in Wayne County, a major fruit production county in New York, found that women, long-term migrants, and those covered by Medicaid were more likely to make annual visits to physicians. Schumacher's study[4] of migrant workers on the eastern shore of Maryland indicates that transportation presented a significant barrier to medical care access. Thus, even when subsidized medical care is available at a nominal fee (e.g., $3 in Wayne County, New York), migrant farmworkers delay treatment of health problems[3] and refrain from use of facilities.[5]

The present study makes three contributions to the existing body of research on medical services utilization by migrant farmworkers. First, the study focuses on farmworkers in Orange County, New York, a vegetable processing region that employs many Hispanic workers. Health status and medical utilization patterns of migrant workers in Orange County have not been identified in the literature. Second, the study examines the determinants of the workers' utilization of federally subsidized migrant clinics, with special emphasis on the role of previous visits to physician offices and emergency rooms. Third, the study tests the hypothesis that the utilization of subsidized clinic facilities by a migratory population is a multi-stage process. The farmworker's efforts to obtain knowledge of available clinics is the first step in utilization. Given knowledge of the available resource, the farmworker can decide whether to use the services or not. Multiple regression procedures are used to examine the factors that influence these two stages.

Primary Data Source

The data used in this study are obtained from on-site interviews of farmworkers who resided in migrant camps in Orange County during the summer and fall of 1986. Due to the difficulties in surveying a group of migratory workers, a special three-stage, stratified random sampling technique was used. This yields a representative sample of workers according to their residence in migrant camps in the county. For a detailed description of the sampling procedure, refer to Chi[6] and White-Means, et al.[7]

Briefly, a comprehensive list of migrant housing units was developed in the first stage of sampling. These included migrant camps, as well as other housing facilities. Housing units were classified in six groups according to their occupancy rates. A small size unit accommodated 1-5 workers; the largest units accommodated 101-201 workers. Thus our sample incorporates workers representing different household structures and living arrangements.

In the second stage, 50 percent of the housing units in each size category were randomly selected. In the third stage of sampling, about 30 percent of working adults in each of the six types of housing units were surveyed. The data are weighted to accounted for over- and under-sampling in the six housing types.

Approximately 40 percent of all adult migrant farmworkers in Orange County were administered detailed surveys.

A structured survey instrument was pretested in 1985 and used in the personal interviews during 1986. Bilingual interviewers administered the questionnaires in either English, Spanish or Haitian, according to the choice of the farmworker. The data collected are unique in that new and formerly unavailable information was obtained on basic sociodemographic characteristics of the county's farmworkers, as well as, physical and mental health status and medical services utilization in both the county of migratory labor and the workers' home community. Detailed interviews were administered to 246 migrant farmworkers. The majority of these workers were male, 87 percent. Workers aged 18-74 were interviewed; the average age of this group was 32.

Analysis Framework

First, the health status of Orange County workers is identified to assess the extent to which this group of workers may need access to medical facilities generally and whether their health status is similar to both predicted and reported health assessments of farmworkers residing in other regions of the United States.

Next, a bivariate analysis of general medical utilization patterns is developed. The majority of the paper focuses on the use or lack of use of a publicly subsidized medical clinic in one county where the migrant laborers work. How unique are the workers' medical utilization patterns when they reside in Orange County? How unique are the workers' patterns of utilization of the migrant clinic when compared to utilization of physician offices or emergency rooms? These questions are answered by examining the relationship between use of these three types of facilities when the worker has a "bothersome" medical condition.

The primary purpose of migrant clinics is to provide migrant workers with better primary health care. One hypothesis that is tested in this study is whether migrant farmworkers' utilization of these subsidized clinics is a two-stage process. Workers must know that the facilities exist before they can decide whether or not to use them. Since migrant workers reside in communities for relatively short periods, such knowledge should not be taken for granted.[5] Indeed, Chi[8] reports that almost 24 percent of farmworkers residing in Wayne County, New York in 1982 did not know that there was a migrant health center in the community. His preliminary exploratory analysis indicated that migrant workers who were recent immigrants were more likely not to know about the facilities available.

It is essential to examine factors influencing migrant farmworkers' knowledge of facilities for two important reasons. First, avenues for increasing use of clinic facilities can be developed. If lack of knowledge is simply explained by years of employment in a particular community, then methods can be developed, possibly through cooperative extension or farm associations, to provide workers with factual information on the regional availability of medical and other social services in the region. On the other hand, if knowledge is lacking because the farmworker's health status is at a level where he does not require use of medical services, policy intervention through information provision is a waste of scarce resources.

The second reason for obtaining information on the determinants of knowledge regards clarity in the statistical analysis of utilization of public clinics. Empirical analysis of the determinants of visit patterns produces muddled information if it does not account for the role of knowledge in utilization. If a bivariate or multivariate regression analysis examines the decision to visit or not, the dependent variable has a value of at least one; if no visit occurs, the value is zero. Respondents who are assigned a value of zero include some with that knowledge and some without. For the later group, one factor that explains their lack of visits may simply be lack of information. Thus, the factors associated with lack of use because of no information about facilities must be distinguished from lack of use because of other factors.

The economics of information literature provides a framework for developing an empirical model of the determinants of knowledge. Stigler[9] assumes that knowledge is not solely determined by one's structural environment. Knowledge (information gathering) also occurs as one evaluates the benefits and costs of seeking information. His hypothesis is that the greater the perceived benefits and the lower the relative costs, the greater the incentives to gain information. The application of the Stigler approach[9] to the analysis of farmworkers' knowledge implicitly hypothesizes that farmworkers have incentives to plan the use of medical facilities for preventive health care services. It is hypothesized that financial/economic resources, structural/environmental factors, health status and personal characteristics/attitudes are factors that measure the benefits and costs of knowledge. Specifically, the economic resources of the family affect its ability to purchase goods and services. If resources are limited, benefits obtained from learning about subsidized services could, in essence, reduce the worker's out-of-pocket expenses. Knowledge of resources are also related to perceptions of need. If physical health is failing, information on free medical services may be valuable. Alternatively, a good sense of mental well-being and positive attitudes about life may influence the perceived value of obtaining information about health services.

Structural factors and personal characteristics may also account for differences in knowledge. In Orange County farmworkers reside from one to fifteen miles from the closest migrant facility. Physical distance to, or a basic lack of familiarity with the community may make it more difficult to obtain information about the community's medical resources. Finally, personal characteristics or attitudes may create barriers or add costs to information gathering. Language and educational attainment are measures of such barriers. Measures of attitudes are more difficult to quantify; in this analysis the variable used is the number of emergency room visits. Patterns of extensive use of emergency rooms reflect a tendency to use medical services in emergent, non-preventive care circumstances.[10] These patterns of utilization are hypothesized to limit the value of information about free services that provide predominantly preventive care.

Several factors that are hypothesized to affect the acquisition of knowledge are also hypothesized to affect the subsequent decision to visit. However, in some cases the rationale for their influence on the former variable is slightly different from that for their influence on visiting. Economic resources and health status are clearly recognized as factors that influence the visit decision as well as the acquisition of knowledge. The cost of using the services available, however, involves more than its price. Although clinic services are subsidized, one cost of utilization is the time consumed in using the facility; farmworkers do not receive time off with pay in order to obtain medical services. Furthermore, the agricultural growing season and the harvesting/processing demands of the farm determine the labor efforts of the workers . Since farmworkers may labor beyond the 5 o'clock hour and on weekends, efforts to seek medical services during the hours of operation may involve a loss of wage income. Minutes of travel time to the facility is the measure of this time cost.[11]

Visits to physicians and emergency rooms may reflect attitudes about and preferences for the use of acute care rather than preventive care facilities, as well as the level of need for medical services after the farmworker has arrived in Orange County. Finally, it is hypothesized that language may continue to represent a barrier to the use of clinic facilities,[2] as well as to collecting information.

INSERT TABLE 1 ABOUT HERE

Results

A. Farmworker Health Status

Table 1 presents the most frequently cited medical conditions of farmworkers in Orange County. Dental problems reflect the most prevalent condition of the workers. Musculoskeletal and respiratory conditions are the most frequently cited medical classifications. Among musculoskeletal conditions, backaches are the most frequently cited and rank as the second most frequently cited condition overall. Other prevalent musculoskeletal conditions are chest pains, swollen joints and arthritis. Among respiratory conditions, coughing is the most frequently reported condition. Other respiratory ailments include allergy/hay fever and shortness of breath.

These self-reported medical conditions are consistent with recent predictions of the occupational health hazards of migrant and seasonal farmwork. Sakala[12] suggests that repetitive activities such as "bending, stooping, lifting, and carrying" should lead to a high prevalence of musculoskeletal conditions among migrant farmworkers. Additionally, Sakala identifies respiratory problems, headaches and rashes as symptoms of acute exposure to pesticides and prolonged exposure to sunlight. The high incidence of dental problems is partially related to the farmworkers' limited access to appropriate medical services.[a]

---

[a] During informal conversations between farmworkers and our interviewers, the farmworkers stated that help was not sought for dental problems because they perceived that dental visits were generally visits to obtain tooth extractions.

INSERT TABLE 2 ABOUT HERE

B. Medical Utilization Patterns

Recent surveys of migrant farmworkers provide direct evidence of their limited use of medical facilities. The data presented in Table 2 compare use of three types of medical facilities with the prevalence of serious medical conditions as self-reported. Farmworkers were considered to have a serious medical condition if they reported being "very much bothered" by one or more medical ailments.

Approximately half of the farmworkers surveyed visited a physician within the past 12 months. This figure is a low utilization rate when compared with the 65 percent of black farmworkers in Wayne County, New York who reported visits to physician offices during a 12 month period.[8]

The data do indicate a weak but positive association between visits to physicians and severity of medical conditions; approximately 64 percent of the Orange County farmworkers visited a physician when faced with medical conditions that were bothersome. The data in Table 2 also suggest the presence of incentives to seek preventive medical care; forty-two percent of farmworkers who did not have bothersome medical conditions reported making at least one annual visit to a physician.

Recent research indicates that minority groups are more likely to visit an emergency room than a physician's office for primary care.[10] This occurs because emergency rooms have flexible hours, are geographically more evenly distributed and the cost of services is frequently covered by insurance. In the present study, however, migrant farmworkers are infrequent users of emergency rooms; only 31 percent of farmworkers with bothersome medical conditions made annual visits to such a facility. As would be expected, those with serious medical conditions are slightly more likely to visit than those with better health.

The relatively low use of emergency rooms was not compensated for by high use of subsidized clinics; only 38 percent of farmworkers in Orange County reported visiting these facilities. The results improve somewhat, to 48 percent, among farmworkers who had a serious medical condition. The number of respondents who reported visiting clinics is considerably lower than the sample size for examining utilization patterns. The reason for this decline is that approximately 27 percent of farmworkers indicated that they did not have knowledge of a medical clinic that provides services to migrant farmworkers.

C. Regression Results

Knowledge of Clinic Facilities

Knowledge of clinic facilities was defined according to the workers response to the question, "In the last year, how many times did you visit the Migrant Health Center in this community for

_____ medical services
_____ dental services
_____ don't know of the center.[b]"

A worker was coded as having no knowledge of the center if the 'don't know' option was chosen. Otherwise, any worker who indicated medical or dental visits of zero or higher was coded as having knowledge of the center.

The regression estimates for knowledge of clinic facilities are derived from the application of a logistic regression procedure. Because the dependent variable in the analysis (knowledge of the clinic facility) is dichotomous, ordinary least squares estimation procedures are inappropriate and would violate assumptions of normality. Based on the logistic regression procedure, the probability of knowledge is defined as

$$1/(1 + \exp(- \quad - X_i \;\; {}_i)),$$

where X_i are the independent variables listed in Table 3.

INSERT TABLE 3 ABOUT HERE

---

[b] In our previous survey instrument that was implemented in 1982 in Wayne County, the question regarding knowledge of the facility was, "Do you know if there is a migrant health center in this community?". There was a separate question on the number of medical visits. The present knowledge question is structured in the above manner to minimize measurement error in response to the knowledge question. Thus we were able to distinguish among workers without knowledge, those with knowledge and without medical visits, those with knowledge yet unable to quantify the number of visits and those with knowledge and quantified visits.

Sixty-nine percent of the 198 farmworkers evaluated in the logistic regression analysis know about migrant clinic services. The factors associated with knowledge are shown in Table 4. The signs of the regression estimates are consistent with the predictions presented in the previous section and the goodness-of-fit indicates overall model significance.

The farmworker's economic resources, health status and personal characteristics influence knowledge of facilities. Workers with high incomes and large migratory families are more likely to have knowledge. The positive income coefficient is consistent with the predictions of economic theory; as more income is available, the desire for all goods increases and the benefits of knowledge of clinic services increase. As expected, farmworkers in families with many workers living in the migratory stream perceive a high value in obtaining knowledge. Even the coefficient of the insurance variable provides weak support for the presence of a rational decision-making process underlying the factors affecting the acquisition of knowledge. Health insurance coverage (the vehicle that opens the door of access to all types of medical services and facilities) is negatively associated with knowledge, for some farmworkers; if the farmworker does not have insurance, he is more likely to have knowledge of the clinic services.

INSERT TABLE 4 ABOUT HERE

A state of poor health was predicted to affect the desire for knowledge of facilities. "Bothersome" medical conditions has a positive sign but the relationship is insignificant while mental well-being and knowledge are negatively related. The mental well-being measure used in this study is a composite measure of depressive moods, life satisfaction, emotional stability, and levels of energy.[13] Thus, as the worker's sense of mental well-being is higher and the worker has less perceived need for medical services, the probability of knowledge is lower.

The signs of the coefficients for the structural/environmental factors are correct but these variables were not significantly related to knowledge. Thus, there is only weak support for the hypothesis that as structural barriers (long distances from facilities and less time to learn about the community) inhibit the acquisition of knowledge, workers are less likely to know about available services.

Of the three personal characteristics predicted to have an influence on knowledge, only education showed the expected relationship--significant and positive. For use of emergency rooms, the coefficient is negative, as predicted, but the relationship is insignificant. The effects of language are the most surprising. The relationship with knowledge is significant but not in the expected direction; farmworkers who spoke English were less rather than more likely to have knowledge.

Medical Visits to the Migrant Clinic

A small trailer facility in Goshen, the health services clinic in Newburgh, and the clinic in Warwick (with referrals to the nearest hospital) provide health services for migrant workers who reside in Orange County. Through use of these clinics, farmworkers have access to physicians with specialties in general practice, obstetrics/gynecology, pediatrics and family practice. Limited dental and outpatient care is also available. Logistic regression procedures were again used to evaluate the decision to visit. The dependent variable has a value of 1 if a farmworker decides to visit. Approximately 32 percent of farmworkers with knowledge of available facilities affirmed that they made at least one visit while living in New York State. The value of the dependent variable is zero for those with knowledge and without visits to the clinic. Table 5 presents the regression results.

INSERT TABLE 5 ABOUT HERE

Mental health status, the price of clinic services and utilization of other types of facilities were factors significantly influencing visits to clinics among farmworkers with knowledge of their availability. While the coefficients of income and family size were positive, as predicted, they were insignificant determinants of medical visits, ceteris paribus. Physical health status (a medical condition that bothers the worker) was positively but not significantly related to the visit decision. The coefficient of mental well-being is negative and significant; as the worker's mental well-being improves, he is less likely to visit.

The role of two types of prices of medical services were examined, direct out-of-pocket expenses for services and indirect service cost. The only service cost to farmworkers for use of subsidized clinical services is the travel cost and the lost opportunity to use that time for employment. The analysis indicates that travel time between the camp and the clinical facilities does not significantly influence the visit decision. On the other hand, health insurance coverage effectively reduces the price of all medical services; both publicly subsidized and private. Equipped with some type of insurance policy, farmworkers are less likely to visit subsidized clinics.

There are insignificant differences in the probability of use between English and Spanish/Creole speaking farmworkers. The coefficient for English speaking is positive but not significant. Utilization of other types of medical facilities and use of emergency rooms clinics are significantly related to use of migrant clinics. The more physician visits that occur both within New York and in other communities of residence, the more the farmworkers visit clinics. On the other hand, the more visits made to emergency rooms, the fewer visits made to migrant clinics.

Discussion

This paper has examined the health status and medical utilization patterns of migrant workers in Orange County, New York. The data presented on the workers' health status augment the limited documentation of the health status of migrant workers.[12] These data indicate that improved access to dental services is essential. The high prevalence of medical conditions that can be linked to the hazards of the workers' employment environment additionally suggest that intervention strategies that are directed toward the improvement of farmworkers' health should also include efforts to improve the occupational safety of migrant farm work.

Efforts to increase the workers' access to medical services can not simply be limited to providing subsidized clinics. It is clear that patterns of use of medical services generally are significantly related to utilization of clinic facilities in Orange County. Migrant workers with medical ailments (medical conditions that were bothersome) were found to use their available resources to attend to health care needs. The data in Table 2 indicate that these workers were most likely to acquire services from a physician. Moreover, their use of the subsidized clinics in New York was both more prevalent than use of hospital emergency rooms and comparable to their patterns of physician utilization. Thus, clinic services that are available in New York State seem essential for the workers' continuous access to medical care services.

Patterns of use of emergency rooms decrease the probability of visits to migrant clinics; on the other hand, patterns of use of physician services increase the probability. These data suggest that efforts to change the farmworker's use of emergency rooms (or, reliance on acute care facilities) could lead to greater use of clinics. It is well documented that emergency rooms are an inappropriate source of primary health care. Furthermore, as the present study shows, if this inappropriate utilization is an established pattern of access to care, farmworkers will be less likely to use subsidized preventive medical care.

The results of the regression analysis suggest that migrant farmworkers actively gain knowledge about subsidized medical facilities in the local community. Thus, the theory of a rational decision-making process based on the evaluation of relative costs and benefits of knowledge is supported in this empirical investigation. A vital policy implication related to this finding is: utilization of medical services is made possible by knowledge of their availability. Knowledge is acquired according to an evaluation of its costs and benefits. Thus visits to medical facilities by migrant farmworkers may be enhanced by affecting their perception of either benefits or costs of knowledge or by intervention directed toward workers with low benefits and/or high costs of knowledge.

The relationship between language and knowledge should be examined more closely. Given earlier research findings indicating that non-English-speaking migrants are less likely to utilize subsidized services, it is unclear why English-speaking migrant farmworkers are less likely to acquire knowledge. One possible explanation of this result is provided in Foner and Napoli's research.[14] They suggest that Jamaican and black American farmworkers have different perceptions of their labor market efforts.

Jamaican workers have used farmwork earnings to achieve independence and to facilitate movement to middle class status; in contrast to black American farmworkers who perceive their migratory labor as "work of last resort." Thus the cost of debilitated health may be relatively high for non-English-speaking farmworkers. Likewise, relative benefits of knowledge of health programs may be perceived to be higher. Further study of this proposition is needed, especially as it relates to the acquisition of preventive medical services.

The results of the visit analysis are consistent with previous research findings of the determinants of migrant farmworkers' medical utilization patterns. Similar to previous studies, health conditions and health insurance coverage were identified as significant factors influencing use of health facilities. The study's unique findings are that (1) mental well-being is a major influence on the lack of use of public clinics by farmworkers, (2) patterns of use of emergency rooms discourages use of clinics while use of physician services encourages it, and (3) the full spectrum of determinants of utilization are defined by both the determinants of knowledge and the determinants of visits.

Of the two health measures, it is interesting to find that mental well-being (rather than severe physical conditions) is most influential in explaining the farmworker's decision to visit migrant clinics or not. Hoppe and Heller[15] reported similar findings in their study of health services utilization by low income Mexican Americans. Specifically, they found that feelings of powerlessness lead to high medical service utilization. Further study of the role of social/psychological health in medical service utilization is needed. In particular, we need to clarify whether this negative relationship between mental well-being and medical service utilization is predominantly a factor for those with lower socio-economic status. These findings of significant use of clinics by farmworkers with low self-esteem and life satisfaction suggest that one unmet need of farmworkers is access to mental health services. Psychological counseling and esteem-building services are currently services that are optionally provided by migrant clinics.

The results of the above analysis suggest several alternative policy options including (1) providing farmworkers with information on the benefits of preventive medical care and (2) increasing the state/regional continuity of access to primary care through improved transportation to existing clinics,[2] improved knowledge of the location of medical service facilities providing care especially for migrant farmworkers, or improved access to Medicaid.

A simultaneous examination of the determinants of knowledge and medical visits is also informative. By looking at the determinants of knowledge separately, we were able to identify factors that significantly influence knowledge yet were not found significant in the medical visit regression. Thus, factors such as income, family size, language and education, that were found significant in the knowledge regression indirectly influence visits.

This research has documented the health status of and addressed the use and lack of use of publicly provided medical services for migrant farmworkers in Orange County, New York. The results from these data are generalizable for farmworkers in this county and are consistent with research in other regions of the United States. Thus, we were able to suggest intervention strategies to both meet the unmet needs of workers and to assist in increasing the utilization of migrant clinics in Orange County. Nonetheless, our understanding of medical utilization patterns by this vital workforce would be greatly enriched through the collection and analysis of longitudinal data that include detailed reporting of utilization patterns along the migrant stream. It is only by these methods that we will be able to determine the extent to which farmworkers have continuous access to health services during a year.

Another unanswered question that could be addressed by the acquisition of comprehensive data is the nature of the substitution that the present research paper indicates occurs between use of clinics and emergency rooms, as well as the complementary relationships between use of clinics and physician offices. Annual longitudinal data for migrant workers would aid the comparison between migrant farmworker populations and other indigent groups who are currently included in national longitudinal data.

REFERENCES

1. Bleiweis, P., R. Reynolds, L. Cohen, and N. Butler. (1977). " Health Care Characteristics of Migrant Agricultural Workers in Three North Florida Counties." Journal of Community Health 3 (1): 32-43.

2. Slesinger, D. and E. Cautley. (1981). "Medical Utilization Patterns of Hispanic Migrant Farmworkers in Wisconsin." Public Health Reports 96 (3): 255-263.

3. Chi, P. (1985). "Medical Utilization Patterns of Migrant Farmworkers in Wayne County, New York." Public Health Reports 100 (5): 480-490.

4. Schumacher, Y. (1983). Migrant Workers on Maryland's Eastern Shore. Washington, D.C.: Commission on Civil Rights.

5. Walker, G. (1979). "Utilization of Health Care: The Laredo Migrant Experience." American Journal of Public Health 69 (7): 667-672.

6. Chi, P. (1985). "A Note on Sampling Migrant Farmworkers." The Rural Sociologist 5 (3): 158-162.

7. White-Means, S., P. Chi, and J. McClain. (1989). "Health and Economic Productivity: A Case Study of Migrant Farmworkers in Orange County, New York." Final Report to the Milbank Memorial Foundation. New York: New York.

8. Chi, P. (1985). "Health Care and Health Status of Migrant Farmworkers in New York State." Migration Today 13 (1): 39-44.

9. Stigler, G. (1961). "Economics of Information." Journal of Political Economy 69: 213-220.

10. White-Means, S. and M. Thornton. (1989). "Nonemergency Visits to Hospital Emergency Rooms: A Comparison of Blacks and Whites." The Milbank Quarterly 67 (1): 35-57.

11. Acton, J. (1976). "Demand for Health Care Among the Urban Poor, With Special Emphasis on the Role of Time." In R. Rossett (Ed.) The Role of Health Insurance in the Health Services Sector. New York: National Bureau of Economic Research.

12. Sakala, C. (1987). "Migrant and Seasonal Farmworkers in the United States: A Review of Health Hazards, Status and Policy." International Migration Review 21 (3): 659-687.

13. Chi, P. (1985). "Variation in Subjective Well-being Among Black Migrant Farmworkers in New York. Rural Sociology 51 (2): 183-198.

14. Foner, N. and R. Napoli. (1978). "Jamaican and Black American Migrant Farm Workers: A Comparative Analysis. Social Problems 25: 491-503.

15. Hoppe, S. and P. Heller. (1975). "Alienation, Familism and the Utilization of Health Services by Mexican Americans." Journal of Health and Social Behavior 16 (3): 304-314.

Table 1. Prevalence of Self-Reported Medical Conditions for Farmworkers in Orange County and the United States Population, 1986

Conditions	Percent Farmworkers Reporting Conditions
Digestive	
Tooth	42.0
Stomach	19.23
Respiratory	
Coughing	24.7
Allergy/Hay Fever	15.65
Short Breath	12.08
Musculoskeletal	
Chest Pain	16.4
Backache	39.64
Swollen Joints	11.95
Arthritis	10.10
Circulatory	
High Blood Pressure	17.9
Other	
Eye	26.6
Headache	33.96
Rashes	11.82

Table 2. Medical Conditions and Visit Patterns

	Medical Condition Bothers (%)		
	Total	Yes	No
1. Visit a physician in New York or in another state			
yes	51.84	64.17	42.01
no	48.16	35.83	57.99
# respondents	245	107	138
$X^2 = 11.86$	$P < 0.001$	$V = 0.220$	
2. Visit the emergency room in New York or in another state			
yes	19.59	30.86	11.09
no	80.41	69.14	88.91
# respondents	245	107	138
$X^2 = 14.89$	$P < 0.001$	$V = 0.246$	
3. Visit migrant clinic in Orange County			
yes	38.33	48.49	28.60
no	61.67	51.51	71.40
# respondents[a]	180	86	93
$X^2 = 7.53$	$P < 0.006$	$V = 0.205$	

[a] Data is reported for farmworkers who had knowledge of the availability of a medical clinic that provides services to migrant farmworkers

Table 3. Independent Variables and Measures for the Assessment of Knowledge and Clinic Visits

Variable	Measures
Income	income in the following categories 0- 3,000 3,001- 6,000 6,001- 9,000 9,001-12,000 12,001-15,000 15,001-20,000 over 20,000
Insurance	= 1 if have insurance; 0 otherwise
Family Size	# family members (including Respondents that live together in the migrant camp
Medical= 1 if have one or more medical conditions that are 'bothersome'	
General Well-being	an index of mental well-being
Minutes of Travel	minutes of travel time to the nearest migrant clinic
Years of Work	years employed in farmwork
Language	= 1 if language is English; = 0 if language is Spanish or Creole
Education	highest grade completed
Emergency Room Visits	# visits to the emergency room
Physician Visits	# physician office visits in the year

Table 4. Logistic Regression Estimates for Knowledge of Available Migrant Clinic Services in New York State

Variable	Coefficient	t statistic
Financial/Economic Resources		
Income	0.285	1.72^{*}
Insurance	-0.316	-0.79
Family Size	0.848	2.95^{***}
Health Status		
Medical	0.257	0.62
General Well-being	-0.033	-1.65^{*}
Structural/Environmental Factors		
Minutes of Travel	-0.006	-0.86
Years of Work	0.012	0.86
Personal Characteristics/Attitudes		
Language	-1.646	-3.26^{***}
Education	0.087	1.65^{*}
Emergency Room Visits	-0.114	-0.39

*, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

$X^2 = 50.16^{***}$
-2 log likelihood= 194.39
$R^2 = 0.35$ N = 198

Table 5. Logistic Regression Estimates for Visits to the Migrant Clinic in Orange County, New York

Variable	Coefficient	t statistic
Financial/Economic Resources		
Income	0.076	0.47
Family Size	0.096	1.01
Insurance	1.408	-2.44***
Minutes of Travel	0.001	0.12
Health Status		
Medical	0.546	1.24
General Well-being	-0.047	-2.35**
Personal Characteristics/Attitudes		
Language	0.222	0.44
Physician Visits	0.198	2.41**
Emergency Room Visits	-0.721	-1.85*

*, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

$X^2 = 34.36^{***}$
-2 log likelihood = 147.58
$R^2 = 0.30$ N = 146

qwe-778

Housing Conditions and Economic Opportunities

A Tale of Two Homes: A Study of Housing Conditions of Migrant Farmworkers

By

Peter S.K. Chi

Printed in Housing and Society, 18(2), 1991.

Abstract

One of the most pressing problems confronting migrant farmworkers and their employers is the lack of standard housing. Unlike the general working population, the migrant needs adequate housing at the job site as well as at the home base.

This study compares home-base and on-the-job housing for a representative sample of migrant farmworkers in Wayne County, New York. The results indicate that substantial proportions of migrant farmworkers live in substandard housing in the home community (25%) and at camp (70%). The extraordinarily high degree of substandard housing at camp is due more to the lack of major plumbing facilities for exclusive private use than to structural defects. Because such a high proportion of the migrant stream in Wayne County, New York is black (95%), discrimination may be a factor in slowing progress by improving conditions.

The logistic regression model indicates that variation in respondents' comparative evaluation between home-base and on-the-job housing can be largely explained by such independent variables as marital status, housing space, physical housing conditions and presence of home community ties.

One of the most pressing problems confronting migrant farmworkers and their employers is the lack of standard housing. Unlike the general population, the migrant needs adequate housing at both the home base and on the job (Brann, 1967). The latter type of housing, usually provided by the employer, represents a long-term capital investment and becomes part of the farm operation. Most on-the-job housing is on the farms where the migrants work; some is in off-farm camps sponsored by growers associations, housing authorities, and processing companies. Some migrant farmworkers rent their own housing in nearby areas. Housing units in the migrant camps are commonly one-room arrangements with central washing and toilet facilities in separate buildings.

The quality of on-the-job housing varies greatly from state to state. All major reports (U.S. Senate, 1969; Miller, 1972; New York State Migrant Education, 1989) indicate that migrant farmworkers usually live in dilapidated structures that are cold and wet in winter and excessively hot in summer. Insufficient ventilation, unsanitary privies and bath facilities, inadequate storage, and unhealthful methods of garbage disposal were often the prevailing conditions. In an effort to guarantee minimum standards in on-the-job housing, many states have established mandatory regulations applicable to migrant camps but the housing standards vary considerably from state to state. Penalties for noncompliance with the regulations also vary greatly (Brann, 1967).

Employers' plans for housing improvement and new construction have been studied by some researchers (LeRoy et al., 1960; Conklin and McElroy, 1966). Several factors were found to influence employers' decisions on housing for their migrant farmworkers: availability and terms of credit, the outlook for crops and prices, possible changes in crops grown, and cropping methods and their effects on labor needs.

Historically, housing in rural areas has been inferior to urban housing, and home-base housing of migrant farmworkers ranks the poorest of all housing for the rural population (Malotky, 1963). Research on housing conditions of migrant farmworkers is somewhat limited while comparative studies of migrant housing at the home base and on the job are even scarcer. The present study compares home-base and on-the job housing for a representative sample of migrant farmworkers in Wayne County, New York. The analysis will focus not only on housing conditions and neighborhood characteristics but also on migrants' subjective comparisons of satisfaction between home-base and on-the-job housing. Both objective and subjective comparisons of housing situations between migrant camps and home communities will provide us with a clear understanding of overall housing problems of migrant farmworkers.

Data

This study is based on data obtained from the New York Migrant Health Interview Survey conducted in Wayne County, New York, in the summer of 1982. In order to obtain a representative sample of migrant farmworkers from which to collect health statistics and housing information, a special sampling procedure was designed for this survey. The first step was to compile a comprehensive list of addresses for all migrant camps and other migrant housing units in Wayne County. All units on the list were stratified according to the size of maximum capacity. The total number of migrants that could be accommodated in each size category was known. A representative sample of 218 migrants was randomly drawn through a three-stage sampling procedure from all size categories (the sample size was determined by budget constraints). Special efforts were made on October 21, 1982, to find out from owners of migrant camps and other housing units how many migrant workers were actually living in the units. On the assumption that the sampled migrants had characteristics similar to those of migrants enumerated on October 21, the interviewed migrants can be considered a representative sample of total migrant workers in Wayne County on that day. The detailed sampling procedure has been described elsewhere (Chi, 1985).

During the 1982 migrant health survey, seven Cornell undergraduate students were hired as interviewers, and one graduate student as project coordinator. All the interviewers had some survey experience through course work in field studies or in research methods. They were also trained in special sessions designed for the migrant project. The project coordinator assigned sampled camps or housing units to interviewers and supervised their daily interview activities. Before the actual interviewing began, the coordinator sent letters to local growers, requesting permission for the interviewers to enter farms and to interview randomly selected migrants.

The survey instrument contained 113 items, covering the migrant farmworker's individual and family characteristics, his or her health habits and attitudes, health status, utilization of health services, home community characteristics, and the physical environment of the current residence. Just before the scheduled interview period, a preliminary test of the questionnaire was conducted among 10 migrant farmworkers in the county, and appropriate revisions were made.

Of the 218 migrant farmworkers in our sample, 167 were born in the United States. In other words, 76.6% of the total sample were native-born Americans. Of the remaining 51 respondents, 44% reported that they were naturalized American citizens. Only 29 were either unnaturalized permanent residents of the United States or illegal aliens. Over 95% were black, 77% were male, and the mean age was 35 years. As might be expected, migrant farmworkers in this sample had a low socioeconomic status. Mean educational level was 9.5 years of schooling, and mean annual income was $5,327 in 1981. Since the respondents were predominantly black, the results from this study can be generalized for black migrant farmworkers in New York State.

Although 218 migrant farmworkers were randomly selected for this study, not all respondents answered every question in the questionnaire and some missing values may appear in the analysis. For accuracy, we presented the valid number of cases separately for different analyses. Further, since every respondent was asked to report housing conditions at the job site as well as at the home base, the total number of responses will be doubled when housing conditions between home communities and migrant camps are compared (see Table 1).

Comparisons Between Home-Base and On-The-Job Housing

The results of objective comparisons of physical conditions, housing space, facilities and services between home-base and on-the-job housing of migrant farmworkers are presented in Table 1.

[Table 1 about here]

Physical Conditions

In Wayne County, over 67% of migrant farmworkers lived in housing units with inadequate plumbing facilities (either lacking one of the three major plumbing facilities--hot and cold running water, flush toilet, shower and/or bath--or having to share facilities with others) while in the home community a much smaller proportion (14%) of them lived in such inadequate housing. Nevertheless, over 81% of housing units in both home communities and migrant camps had no structural defects (i.e., open cracks or holes in the interior walls or ceiling, holes in the floors and leaking roofs). The relatively low number of structural defects in camp housing in the sample may be due to the fact that migrant camps in New York State are generally inspected bimonthly during the season of occupancy and at least once prior to occupancy; any structural defects found must be corrected before the employer is permitted to operate the camp. Using either structural defects or inadequate plumbing as a measure of substandard housing, over 70% of camp housing units and 25% of home-base housing were considered substandard, while only 7.4% of rural housing units in the United States were so classified in 1980 (Bureau of the Census, 1981).

Housing Space, Facilities and Services

In general, home-base housing tended to have more space than camp housing, to be less crowded, and to have a higher level of public services. Nearly 60% of home-base housing but only 6% of camp housing had more than five rooms. Over 66% of migrant farmworkers occupied one-bedroom housing in camp, while less than 18% of respondents had only single bedroom housing in the home community. Overcrowding in housing space, as illustrated by a measure of use-crowding, was apparent at both locations but was much worse in camp housing. While 15% of migrant farmworkers used living, dining or kitchen area as bedroom space in home-base housing, over 30% of them did so in camp housing. Finally, much higher proportions of respondents in home-base housing units than in camp housing units used city or private garbage collection services and were hooked up with city sewer systems and linked with city running water supplies. Obviously, on-the-job housing conditions are much worse than home-base housing, but migrant housing conditions in the home community, at least for black migrant farmworkers, are worse than overall rural housing in general.

Housing Variation in the Home Community

Since migrant farmworkers are not homogeneous and housing conditions usually vary between owner-occupied and rental units, variation in housing conditions in the home community among migrant farmworkers will be examined in terms of their tenure status. Four aspects of housing conditions, structure type, physical conditions, housing space, facilities and services, are presented in Table 2.

[Table 2 about here]

Structure Type and Physical Conditions

Since there were more renters than owners (158 vs. 60) in the sample, the homeownership rate of black migrant farmworkers in the home community is estimated to be 27.5%, this figure not only is lower than the national homeownership rate (64.7%), but also is lower than that of the black population in the United States (45%) (Bureau of the Census and HUD, 1983). These results suggest that seasonal mobility may combine with racial discrimination to severely limit the opportunity of owning a home for most black migrant farmworkers.

Over three-fourths of homeowners in the sample lived in single-family detached units and about 90% of renters were divided between single-family (39%) and multifamily units (51%). Unlike housing for the general population, the quality of migrant housing at the home base tended to be similar for both owners and renters. Although a significantly higher proportion of owners than renters (94% vs. 83%) lived in housing units equipped with all major plumbing facilities, over 85% of both groups lived in housing with no structural defects. When these two measures were combined into a single measure of substandard housing, the difference between owners and renters living in substandard units (19% vs. 29%)

was not significant. This similarity, in conjunction with the relatively high level of overall substandard housing at the home base (26%), may reflect the continuing effects of uniform poverty and constant uprootedness among black migrant farmworkers.

Housing Space, Facilities and Services

In terms of housing space, migrant owners tended to occupy housing with more rooms and bedrooms than their renter counterparts. For example, over 83% of migrant owners lived in homes with five or more rooms and over 30% of them in housing with four or more bedrooms. The corresponding figures for migrant renters were 39% and 13% respectively. However, the difference between owners (17%) and renters (15%) in use-crowding, a condition in which living, dining or kitchen area is used as bedroom space, was not significant.

So far as facilities and services are concerned, renters seemed to be somewhat better served than owners. Migrant renters were more likely than migrant owners to use city garbage collection services and rental units were much more likely than owner-occupied units to be hooked up with city sewer systems; the lack of sewer connections was the most serious inadequacy in owned housing at the home base. It was also a deficiency for renters, 29% of whom live in units without sewer hookups. These results may simply reflect the fact that a majority of rental units are centrally located within a city boundary. Similar proportions of both owners and renters of migrant home base housing use city water systems (over four-fifths) or have private wells or springs (about one-fifth) for water supplies.

Neighborhood

Neighborhood conditions in migrants' home communities were examined according to four distinct characteristics: (a) perceived socioeconomic status of neighbors; (b) adverse conditions observed in the neighborhood; (c) satisfaction with neighborhood services and (d) overall satisfaction with the neighborhood. These comparisons of neighborhood conditions between migrant owners and renters are presented in Table 3.

[Table 3 about here]

Based on perceived socioeconomic status of neighbors, migrant owners seemed to be more likely than renters to live in a segregated neighborhood in which most of their neighbors are black (87%). A majority of migrant owners' neighbors were homeowners and had a similar level of family income.

Respondents in our sample were asked whether the following conditions existed on streets in their neighborhoods: (1) street noise, (2) streets or roads continually in need of repair or with open ditches, (3) neighborhood crime, (4) trash, litter or junk in the streets or on empty lots or on properties in the neighborhood, (5) boarded-up or abandoned structures, (6) industries, business or other nonresidential activities, and (7) smoke, gas or other odors. A summated score of these seven items is used to construct an index of adverse conditions in the neighborhood. The difference in adverse conditions between migrant renters and owners was not significant; on average, 2.37 adverse neighborhood conditions existed in migrant farmworkers' home communities.

Respondents were also asked whether they were satisfied with five major neighborhood services: police protection, outdoor recreational facilities, hospital or health clinics, general shopping and neighborhood stores. Degree of satisfaction with neighborhood services ranges from 5 to 0, the highest score (5) indicates a high degree of satisfaction with all five services, and a score of 0 indicates dissatisfaction with all of them. Degree of satisfaction with services tended to be higher for migrant renters (4.19) than owners (3.50), probably because the former group was more likely to be centrally located and to receive better neighborhood services. Owners' overall rating of neighborhood in the home community, however, was significantly higher than that of renters; over 80% of owners vs. 59% of renters rated their neighborhoods as either good or excellent.

In the general housing market, housing quality of owner-occupied units tends to be better than that of rental units, but for migrant home-base housing no such distinct difference has been found. Further, migrant renters are more likely than migrant owners to use city garbage collection and sewer services, and their degree of satisfaction with neighborhood services is also significantly higher than that of migrant owners. These findings clearly indicate that migrant homeowners do not necessarily enjoy the decent housing conditions that many other homeowners do.

Variation in Wayne County, New York

As discussed before, on-the-job housing in the study was much worse than home-base housing. When farmworkers migrate to New York State for summer jobs, most of them live in migrant camps although some migrant farmworkers rent their own housing in nearby areas. Do all migrant farmworkers live in the same poor housing conditions or are some better off than others? The analysis in this section will try to answer this question. Since camp housing units are located in similar rural environments, no attempt will be made to analyze variation in neighborhood characteristics. Variation in housing conditions in Wayne County, however, will be examined among migrant farmworkers according to migrant status because different migration experiences may affect their access to decent housing. In our sample, three distinct migrant groups were identified. The first group consists of immigrants from Puerto Rico or from other countries (mostly from Haiti and Jamaica); the second group, recent migrants, includes native-born farmworkers who had made a seasonal migration to New York State for less than 3 years; and the third group, long-term migrants, includes native-born farmworkers who had made a seasonal migration to New York State for 3 or more years. Table 4 shows housing conditions in Wayne County for these three groups.

[Table 4 about here]

Physical Conditions, Facilities and Services

Among the three migrant groups, long-term migrants are more likely than the other two groups to live in standard housing units (46% for long-term migrants, 14% for recent migrants and 15% for immigrants). Further, a higher proportion of long-term migrants than of the other two groups use city or private garbage collection services and modern sewage systems (city sewers or septic tanks). All the migrant groups received their water supply from similar sources (35% from city water systems and 65% from private wells or springs). The major reasons for the better housing units and higher quality of services among long-term migrants are, first, through repeated migrations, this group has acquired sufficient knowledge about the local housing market to find better housing in Wayne County; and second, because they have worked for the same employers for a long period of time (an average of 6 years has been reported), they usually receive better housing from the employer as a reward for their loyalty. At the same time, even though long-term migrant farmworkers are better off than the other two groups, their camp housing is far from adequate--over 50% of long-term farmworkers lived in substandard housing (see Table 4).

Housing Space

Although no significant difference in housing space (as measured by number of rooms and bedrooms) was found to exist among the three migrant groups, long-term migrants tended to suffer a greater degree of use-crowding (i.e., 36% of long-term migrants used living, dining or kitchen areas as bedroom space in contrast to 31% of recent migrants and 17% of immigrants). This crowding condition may reflect the fact that long-term migrants usually have larger families than either recent migrants or immigrants.

Determinants of Comparative Residential Satisfaction

Comparative analysis in the previous sections have clearly shown that migrant farmworkers in this study experienced the worst housing and neighborhood conditions as measured by commonly used objective indicators. Facing similar adversities, some migrant farmworkers may be more satisfied than others with their living environment. The ultimate measure of decent housing and suitable living environment is residents' levels of subjective satisfaction. This measure provides a means of identifying housing deficiencies from the user's standpoint and can lead to the formulation of solutions targeted to specific problem areas.

Whether the degree of residential satisfaction among migrant farmworkers is influenced by physical aspects of housing conditions and neighborhood characteristics or affected by other relevant variables will be examined in a multivariate model. Since migrant farmworkers need adequate housing at both the home base and on the job, subjective evaluation of residential satisfaction should be made between these two types of housing. In our study respondents were asked to compare their current residence in the camp with their housing units in the home community. About 49.7% of migrant farmworkers reported "worse off," 45.3% "about the same," and only 5% "better off." "Worse off" was coded as 0, "about the same" and "better off" were jointly coded as 1. Since the dependent variable, comparative residential satisfaction, is a dichotomized variable (0 or 1), a logistic regression is considered an appropriate technique for analysis. The independent variables expected to affect comparative housing satisfaction can be loosely grouped under four headings: demographic characteristics, housing characteristics, neighborhood characteristics of home community, and measures of home community tie. Such basic demographic variables as age, sex and marital status are used as control variables in the logistic regression model.

Three sets of housing characteristics are used to reflect housing conditions in both migrant camps and home communities, and their expected relationships with comparative residential satisfaction will be in opposite directions. For instance, migrant farmworkers who had a large number of rooms in the home community would be less likely to report that they were "about the same" or "better off" in camp housing. On the other hand, those who had a large number of rooms in camp housing are more likely to assess it positively. Similarly, structural defects in home-base housing would positively affect respondents' residential satisfaction with on-the-job residence whereas structural defects in camp housing would inversely affect their satisfaction with housing in migrant camps. Finally, adequate plumbing in camp housing is expected to have a positive relationship with comparative residential satisfaction whereas the relationship of adequate plumbing in home-base housing should be negative.

Satisfaction with neighborhood services in the home community is expected to be negatively associated with camp housing satisfaction. That is, respondents who were more satisfied with neighborhood services in their home communities are less likely to assess camp housing positively.

Respondents' personal ties with home communities are measured by two variables: whether they were homeowners in the community and number of relatives living in the same community. Generally speaking, homeowners tend to have stronger ties with the community than renters; persons with relatives living in the home community are more likely to maintain a strong connection than those without relatives. Therefore, we hypothesize that both measures of home community ties may be negatively associated with camp housing satisfaction. In other words, the stronger the community tie, the less likely the respondent is to favor camp housing. Results of the logistic regression model are presented in Table 5.

[Table 5 about here]

It is somewhat surprising to find from Table 5 that married migrants were more satisfied with camp housing than nonmarried ones when other variables are statistically controlled (coefficient = .85, significant at the 5% level). This result may be due to the fact that married migrants are more likely to bring their families to New York for seasonal farm work. Housing space was found to have the expected relationships with comparative residential satisfaction. For example, having a large number of rooms in home-base housing decreased a respondent's satisfaction with camp housing (-.24), whereas occupying a large number of rooms in the camp had a positive effect (.57). Adequate plumbing facilities in camp housing generated a positive rating whereas structural defects in the same housing produced a negative rating toward on-the-job housing. Further, both measures of home community ties, homeownership and number of relatives in the home community, were negatively associated with satisfaction with camp housing. In sum, variation in respondents' comparative evaluation of on-the-job housing can be largely explained by such independent variables as marital status, housing space, physical housing conditions and presence of home community ties.

Conclusions and Implications

This study compares home-base and on-the-job housing for a representative sample of migrant farmworkers in Wayne County, New York. The results indicate that substantial proportions of migrant farmworkers lived in substandard housing in the home community (25%) and at camp (70%) (see Table 1). The extraordinarily high degree of substandard housing at camp is due more to the lack of major plumbing facilities for exclusive private use than to structural defects. Inasmuch as structural defects have become a relatively minor problem of migrant housing, the worst quality inadequacy now is the lack of plumbing facilities and municipal sanitary services. To improve migrant housing in these two areas, substantial capital investments are required from both employers and municipal governments. Federal low-interest loan programs are also needed for some employers to upgrade their substandard camp housing units.

Another problem related to camp housing conditions is the existence of severe conditions of overcrowding (over 30% of migrant farmworkers used living, dining or kitchen area as bedroom space). Many farmworker families and households occupy temporary housing originally intended for single (primarily male) workers (as indicated by the low average number of rooms in Table 4). Longer term use of temporary housing units raises questions about the adequacy of this housing and the effects of crowding on sanitation and camp cooking facilities. From the viewpoint of housing supply, one may suggest that migrant farmworkers should leave their families at home so they can fit into existing camp housing, However, migrating with family members may maintain a sense of "home." Further, keeping the family together will certainly reduce the adverse impacts of constant mobility. For instance, previous studies have shown that migrants with family members in the camp are less likely to have drinking problems (Chi and McClain 1989) and more likely to have a higher level of subjective well-being (Chi, 1986). Further, married migrants who bring their families to New York for seasonal farm work are more satisfied with camp housing than nonmarried ones when other variables are statistically controlled (see previous discussion about Table 5). After taking all aspects into consideration, provision of decent housing for migrant families may be an appropriate strategy to maintain a stable and productive labor force.

A further problem linking health status and housing conditions is the proximity of farm labor camps to farming areas. Close proximity may result in contamination of housing as a result of aerial spraying and pesticides seeping into the wells and springs from which a majority of migrant farmworkers receive their water supply (see Table 4). The health effects of "chronic low level exposure to pesticides are relatively unknown but may include dermatitis and polyneuropathy" (Morse et al., 1982). Better documentation is needed on the impact of living in close proximity to farming areas where pesticides are heavily used. In addition, if proper washing and laundry facilities are not provided, then more extensive problems of contamination of housing and food preparation areas may exist than have been studied.

Rural housing assistance in the United States has developed primarily through the provision of credit for homeownership and loans and grants for home repair by the Farmers Home Administration. More recently, some special direct assistance programs of the Department of Housing and Urban Development have been used in nonmetropolitan areas that meet certain population requirements. On the whole, the provision of better housing for farmworkers has not been a major focus of rural housing assistance programs at the federal level.

Because rural housing policy is not well developed, it is not surprising that the provision of on-the-job housing for migrant farmworkers has not been taken up directly by any federal agency recently except under Sections 514 and 516 of the Farmers Home Administration's (FmHA) farm labor housing loans and grants programs. Some state housing agencies (e.g., in California) have developed new housing for migrant families using both state and federal funds. As of 1981, 1,583 units were provided indirectly using the FmHA farm labor loans and grants program. Some 1,517 units were also provided in rural areas using FmHA rural rental assistance under Section 515 (Hartmen, 1983).

In some nonmetropolitan areas where adequate rental housing units are available, housing vouchers not tied to particular residential locations would permit migrant farmworkers to rent housing in some low-income housing markets that are now closed to them. The higher quality of home-base housing (see Table 1), which migrant farmworkers presumably found for themselves, strongly supports this suggestion.

Housing deficiencies for migrant farmworkers are not limited to on-the job housing only; home-base housing also has problems of structural defects (14%), lack of major plumbing facilities (14%) and overcrowding (15%). A previous analysis (Chi, 1986) indicates that poor home-base housing conditions have negative effects on migrant farmworkers' subjective well-being. Therefore, the migrant housing programs discussed above should apply to inadequate home-base housing as well as to on-the-job housing.

This study also found that migrant farmworkers, most of whom were black, had an extremely low homeownership rate in their home communities (27.5%). Limitations on homeownership whether due to racial discrimination, seasonal mobility, or a combination of causes, will significantly increase black migrant farmworkers' housing costs, by denying them an effective hedge against inflation, and depriving them of an important means of wealth accumulation (for a detailed discussion of these points, see Kain and Quigley, 1972).

REFERENCES

Brann, R.R. (1967). Housing of Migrant Agricultural Workers. Texas Law Review, 46:933-949.

Bureau of the Census (1981). Detailed Housing Characteristics, U.S. Summary Census of Housing, Table 81.

Bureau of the Census and Department of Housing and Urban Development (1983). Annual Housing Survey: 1983.

Chi, P.S.K. (1985). A Note on Sampling Migrant Farmworkers. The Rural Sociologist, 5(3):158-162.

Chi, P.S.K. (1986). Variation in Subjective Well-being Among Black Migrant Farmworkers in New York. Rural Sociology, 51(2):183-198.

Chi, P.S.K. and J. McClain. (1989). Drinking, Farm and Camp Life: A Study of Drinking Behavior in Migrant Camps in New York State. Presented at the Conference on Meeting Health Promotion and Health Maintenance Needs of Rural Populations, Bozeman, Montana, July 18-21.

Conklin, M.J. and R.C. McElroy. (1966). A Survey of Migrant Farmworker Housing in Oregon. (Oregon Agricultural Experimental Station Bulletin No. 602). Corvallis, OR: Oregon State University.

Hartmen, C. (Ed.). (1983). America's Housing Crisis: What is to be Done? 37-38 Boston, MA: Routhledge and Kegan Paul.

Kain, J.F. and J.M. Quigley. (1972). Housing Market Discrimination, Homeownership, and Savings Behavior. American Economic Review. 62:263-277.

LeRoy, N.L., E.F. Sharp and D.F. Larson. (1960). Migratory Farm workers in the Atlantic Coast Stream VII. Housing and Technology (New York Agricultural Experimental Station No. 948). Cornell University.

Malotky, M. (1963). Better Housing in the Country. A Place to Live, the Yearbook of Agriculture. 185.

Miller, P.F. (1972). To House the Migrant. Geneseo, NY: State University, College of Arts and Science.

Morse, D.L., R. McLellan and C. Christopherson. (1982). Potential Pesticide Exposure of Migrant Farmworkers Living Within Spray Areas. Journal of Environmental Health 44(6):301-304.

New York State Migrant Education. (December 1989). Migrant News/Views, 26-27, 32-33, 35-37.

U.S. Senate. (1969). The Migratory Farm Labor Problem in the United States. 1969 Report of the Committee on Labor and Public Welfare, United States Senate, Sub-Committee on Migratory Labor. Washington, DC.: U.S. Government Printing Office.

Table 1. Comparisons of Housing Conditions Between Home Communities and Migrant Camp (Column Percent)

		Place	
Housing Conditions	Combined Responses	Home	Camp
1. Physical conditions			
(1) Major plumbing facilities[1]			
No	40.93	14.05	67.50
Yes	59.07	85.95	32.50
N	434	216	218
(2) Number of structural defects[2]			
None	84.01	86.32	81.69
1	11.40	8.82	13.97
2	2.95	2.61	3.29
3	1.65	2.25	1.05
N	436	218	218
(3) Substandard housing[3]			
No	52.26	74.91	29.61
Yes	47.74	25.09	70.39
N	436	218	218
2. Housing space			
(1) Number of rooms[4]			
1	11.25	4.01	18.54
2	14.59	4.25	25.01
3	22.13	14.47	29.85
4	19.14	18.15	20.14
5+	32.90	59.12	6.46
N	430	216	214
(2) Number of bedrooms[5]			
0	1.34	1.64	1.05
1	42.27	17.92	66.35
2	22.04	23.83	20.27
3	24.40	37.03	11.91
4+	9.95	19.58	.42
N	433	215	218

Table 1. (continued)

Housing Conditions	Combined Responses	Place	
		Home	Camp
(3) Living-dining-kitchen area used as bedroom space[6]			
No	77.02	84.69	69.09
Yes	22.98	15.31	30.91
N	417	212	205
3. Facilities and services			
(1) Garbage collection[7]			
City service	53.43	78.03	29.08
Private service	18.19	8.54	27.74
Dump	28.38	13.43	43.18
N	434	216	218
(2) Sewage[8]			
City sewer	38.36	65.33	11.93
Other	61.64	34.67	72.16
N	432	214	218
(3) Source of water[9]			
City system	57.86	81.38	34.49
Private well or spring	42.14	18.62	65.51
N	432	216	216

---

1. $\chi^2 = 128.42$, $P < .001$
2. $\chi^2 = 3.95$, n.s.*
3. $\chi^2 = 89.88$, $P < .001$
4. $\chi^2 = 154.41$, $P < .001$
5. $\chi^2 = 128.84$, $P < .001$
6. $\chi^2 = 14.31$, $P < .001$
7. $\chi^2 = 107.31$, $P < .001$
8. $\chi^2 = 130.44$, $P < .001$
9. $\chi^2 = 97.45$, $P < .001$

* n.s. = statistically not significant

Table 2. Housing Conditions in the Home Community by Tenure Status, 1982
(Column Percent)

Housing Conditions	Tenure Status		
	Total	Renter	Owner
1. Type of Housing structure[1]			
Single-family detached	50.02	38.85	79.55
Walk-up apartment	14.66	19.63	1.54
Multifamily unit	23.20	31.23	1.98
Other	12.12	10.30	16.93
N	218	158	60
2. Physical conditions			
(1) Major plumbing facilities[2]			
No	14.05	17.11	6.05
Yes	85.95	82.89	93.95
N	216	156	60
(2) Number of structural defects[3]			
None	86.16	85.98	86.64
1	8.92	8.93	8.91
2	2.64	2.56	2.86
3	2.27	2.53	1.59
N	216	156	60
(3) Substandard housing[4]			
No	73.94	71.43	80.60
Yes	26.06	28.57	19.40
N	218	158	60
3. Housing space			
(1) Number of rooms[5]			
1	4.21	5.92	0
2	6.07	8.56	0
3	18.69	25.66	1.61
4	19.16	21.05	14.52
5+	51.87	38.82	83.87
N	214	154	60

Table 2. (continued)

Housing Conditions	Tenure Status		
	Total	Renter	Owner
(2) Number of bedrooms[6]			
0	.94	1.32	0
1	22.54	31.13	1.61
2	27.23	31.79	16.13
3	31.46	23.18	51.61
4+	17.84	12.58	30.65
N	213	153	60
(3) Living-dining-kitchen area used as bedroom space[7]			
No	84.70	85.23	83.35
Yes	15.30	14.77	16.65
N	212	152	60
4. Facilities and services			
(1) Garbage collection[8]			
City service	78.03	79.75	73.55
Private service	8.53	5.55	16.34
Dump	13.43	14.70	10.11
N	217	157	60
(2) Sewage[9]			
City sewer	65.34	71.14	50.40
Other	34.66	28.86	49.60
N	214	154	60
(3) Source of water[10]			
City system	81.38	81.68	80.62
Private well or spring	18.62	18.32	19.38
N	216	156	60

---

1. $\chi^2 = 41.65$, $P < .001$
2. $\chi^2 = 4.38$, $P < .05$
3. $\chi^2 = 0.19$, n.s.
4. $\chi^2 = 1.89$, n.s.
5. $\chi^2 = 40.81$, $P < .001$
6. $\chi^2 = 41.10$, $P < .001$
7. $\chi^2 = 0.12$, n.s.
8. $\chi^2 = 6.80$, $P < .05$
9. $\chi^2 = 8.19$, $P < .01$
10. $\chi^2 = 0.03$, n.s.

Table 3. Neighborhood Characteristics in the Home Community by Tenure Status
(Column Percent or Mean Values)

Housing Conditions	Tenure Status: Total	Renter	Owner
1. Perceived socioeconomic status of neighbors			
(1) Tenure status of most neighbors[1]			
Renter	35.02	47.19	4.66
Owner	60.56	46.91	94.59
Mixed	4.42	5.89	0.59
N	209	149	60
(2) Racial composition of most neighbors[2]			
White	4.60	5.58	2.08
Black	74.79	69.85	87.49
Mixed	20.61	24.57	10.43
N	214	154	60
(3) Family income of most neighbors[3]			
Less than respondent's	5.55	5.75	4.88
Same	55.49	49.61	74.70
More than respondent's	38.96	44.64	20.42
N	150	115	35
2. Index of adverse conditions in the neighborhood[4]			
Mean	2.37	2.54	2.03
N	206	155	51
3. Degree of satisfaction with neighborhood services[5]			
Mean	3.93	4.19	3.50
N	204	153	51
4. Overall rating of neighborhood in the home community[6]			
Poor	4.44	6.12	0.0
Fair	29.80	33.98	18.79
Good	33.43	33.85	32.34
Excellent	32.33	26.05	48.87
N	217	157	60

1. $\chi^2 = 40.64$, $P < .001$
2. $\chi^2 = 7.12$, $P < .05$
3. $\chi^2 = 7.13$, $P < .05$
4. $F = 4.21$, n.s.
5. $F = 6.21$, $P < .05$
6. $\chi^2 = 14.03$, $P < .01$

Table 4. Housing Conditions in Wayne County, New York by Migrant Status, 1982
(Column Percent)

Characteristics	Migrant Status			
	Total	Immigrants	Recent Migrants	Long-term Migrants
1. Physical condition				
(1) Major plumbing facilities[1]				
No	42.47	51.84	57.48	29.58
Shared	24.76	29.70	26.89	21.19
Exclusive use	32.77	18.47	15.65	49.24
N	216	51	59	106
(2) Number of structural defects[2]				
None	81.46	76.66	75.59	87.01
1	14.15	17.48	20.90	8.80
2	3.33	4.93	2.75	2.90
3	1.06	0.93	0.76	1.29
N	216	50	59	106
(3) Substandard housing[3]				
No	29.86	15.17	13.63	45.98
Yes	70.14	84.83	86.37	54.02
N	216	51	59	106
2. Housing space				
(1) Number of rooms[4]				
1	26.67	27.66	32.31	22.45
2	27.14	19.15	29.23	29.59
3	25.71	340.04	26.15	21.43
4	14.76	14.89	9.23	18.37
5+	5.71	4.26	3.08	8.16
N	212	47	59	106
(2) Number of bedrooms[5]				
0	1.40	0	1.52	1.98
1	71.50	80.85	78.79	62.38
2	17.76	12.77	13.64	22.77
3	8.88	6.38	4.55	12.87
4+	.47	0	1.52	0
N	212	47	59	106

Table 4. (continued)

	Migrant Status			
Characteristics	Total	Immigrants	Recent Migrants	Long-term Migrants
(3) Living-dining-kitchen area used as bedroom space[6]				
No	69.56	83.00	69.47	63.58
Yes	30.44	17.00	30.53	36.42
N	203	46	54	103
3. Facilities and services				
(1) Garbage collection[7]				
City service	29.14	12.58	35.45	33.57
Private service	27.33	23.25	26.93	29.52
Dump	43.53	64.77	37.83	36.92
N	216	51	59	106
(2) Sewage[8]				
City sewer	12.03	5.85	16.41	12.55
Septic tank	54.98	44.86	46.53	64.57
Other	32.98	49.29	37.06	22.88
N	216	51	59	106
(3) Source of water[9]				
City system	34.57	33.23	40.78	31.70
Private well or spring	65.43	66.27	59.22	68.30
N	215	51	59	105

1. $\chi^2 = 26.83$, $P < .001$
2. $\chi^2 = 5.87$, n.s.
3. $\chi^2 = 25.92$, $P < .001$
4. $\chi^2 = 9.05$, n.s.
10. $\chi^2 = 11.65$, n.s.

6. $\chi^2 = 5.71$, $P < .06$
7. $\chi^2 = 13.37$, $P < .01$
8. $\chi^2 = 13.79$, $P < .01$
9. $\chi^2 = 1.44$, n.s.

Table 5. Logistic Regression Analysis of Migrants' Subjective Comparisons Between Home-base and On-The-Job Housing

Variables	Mean	Coefficient	Standard Error	χ^2
I. Demographic Characteristics				
Sex	.80	-.33	.49	.45
Age	35.36	.02	.02	1.56
Marital status	.37	.85	.41	4.25**
II. Housing Characteristics				
No. of rooms in home-base housing	4.84	-.24	.12	4.06**
No. of rooms in camp housing	2.70	.57	.29	3.89**
Structural Defects in home-base housing	.19	.51	.31	2.67
Structural Defects in camp housing	.24	-.64	.35	3.23*
Adequate plumbing in home-base housing	.86	-.78	.56	1.91
Adequate plumbing in camp housing	.33	1.34	.45	8.75***
III. Neighborhood Characteristics of the Home Community				
Satisfaction with neighborhood Services	3.41	-.002	.24	0
IV. Measures of Home Community Tie				
Home ownership in the community	.27	-1.74	.86	4.06**
No. of relatives in the community	1.45	-.33	.14	5.72***
Intercept	---	1.90	1.68	1.29

Dependent Variable: Subjective comparison between home-base and on-the-job housing.

0 = worse off	(N=86)
1 = same or better off	(N=87)

-2 Log Likelihood = 183.99*** Model χ^2 = 56.12*** with 12 d.f.

* P < .07 ** P < .05 *** P < .01

Migrant Farmworker Earnings: A Human Capital Approach

by

Shelley I. White-Means

Printed in the Review of Black Political Economy, Spring, 1987.

Abstract

Migrant farmworkers are essential to the supply of low cost agricultural produce. However, employment earnings of this vital labor force approximately equal federal poverty income guidelines. This study examines the role of health capital investments in enhancing farmworker productivity and employment earnings. Health capital investments are found to have a larger marginal effect on earnings than other forms of human capital investments, such as education or experience.

I. Introduction

Migrant farmworkers are essential to agricultural production in New York State. They provide farmers with a low cost labor supply utilized in the harvesting and processing of the State's major fruit and vegetable crops--apples, pears, beans, onions and corn. Their work efforts are in part responsible for the relatively low final cost of marketable fruit and vegetable crops.

Although many farmworkers travel hundreds of miles to perform arduous work, their earnings , on average, roughly approximate the federal poverty level income guidelines. Estimates from the New York State Department of Education indicate that annual farmworker incomes average $5000 and $6500 per worker and farmworker family, respectively. In comparison, the federal poverty level income is $4950 per individual and $10,200 per family. Due to residency requirements or delays in the processing of applications, farmworkers seldom qualify for assistance through welfare or other local social service programs.

Migrant farmworkers have a higher incidence of health problems than other impoverished rural groups. The occurrence of maternal mortality is four times that of other rural groups. Their infection and parasitic disease rates are 200-500 percent higher than the national average (Goldfarb, 1981).

Health problems present a dilemma in farmworker efforts to generate income. Migrant farmworkers are reimbursed for their work efforts predominantly on the basis of a piece-rate wage structure (payment according to output harvested or processed during some fixed time period). Piece rate systems are used by employers who find it costly to monitor the performance of individual employees and want to insure that worker production time is efficiently utilized. Through the piece rate system, the farmworker's ability to earn a living is directly tied to his individual productivity. Health problems may lead to reduced productivity.

Farmworker productivity need not be innately determined. A body of research attests to the ability of workers to directly increase their productivity, usually measured by wage rates, through investments in human capital--investments in formal education, on-the-job training and health [Becker (1964) and Mincer (1974)]. Investments in health have also been thought to increase the time workers have available to engage in work [Grossman (1972), Grossman and Benham (1974), Luft (1975), Bartel and Taubman (1979) and Berkowitz, Fenn and Lambrinos (1983)].

Using a national population sample, Grossman (1972) found that a one percent increase in the use of health services will lead to a .545 percent reduction in work days lost. For a black population sample, Luft similarly found that "well" and "sick" black employees exhibit significant differences in weeks worked and earnings per week. Lack of perfect health leads to a reduction of 7.15 and 7.77 weeks worked for black men and women, respectively. In dollars of earnings this reduction was estimated to represent a loss of $1010 and $481.

Both Bartel and Taubman and Berkowitz, et al., examine the role of specific diseases in affecting earnings. For a sample of white, military veteran, male twins, Bartel and Taubman found the existence of the following health conditions to affect negatively either wage rates or hours of work: neurosis, arthritis, bronchitis, emphysema, asthma and psychosis. For a sample of white males aged 26-65, Berkowitz, et al, indicate that the affect of ill health on earnings depends on whether there is a health impairment to the hands, arms or legs. There is a larger reduction in earnings from impairments to the hands than from impairments to the latter physical components.

In a model in which health capital/investment is endogenous, Grossman and Benham (1974) find that health capital may have an even larger marginal effect on wages than other forms of human capital investments such as education or experience. They further note that the human capital investment, education, directly affects health; ill-health is negatively related to years of formal education.

This paper applies the empirical model developed by Grossman and Benham. It tests the hypothesis that migrant farmworker productivity and earnings are similarly affected not only by such traditional human capital factors as formal education and work experience, but also by health capital investments. This represents a test of the relative effects on productivity of investments in knowledge (education and experience) and investments in physical strength and mental well-being (health capital). By utilizing the Grossman and Benham approach (which considers health capital as an endogenous variable in an empirical model explaining worker productivity), structural parameter estimates are generated which assess the effects of other human capital investments (eg. education) and medical service expenditures on the production of migrant farmworker health capital. Given a significant role of health capital investments in influencing productivity (a hypothesis we might consider more relevant for migrant farmworkers than for workers in general), the empirical results from the health capital equation have implications for health policy addressing the needs of migrant farmworkers.

II. The Data

The data utilized in this study are from the New York Migrant Interview Survey. Migrant farmworkers in Wayne County, New York were interviewed in their camps during the summer of 1982. Among other things, information was obtained on their utilization of health care services, health insurance coverage, assessment of personal health levels, and socio-demographic characteristics.

Approximately 8,000-10,000 migrant farmworkers travel to New York State each year. Farmers in Wayne County employ more migrant farmworkers than farmers in any other county in New York State. Wayne County is the state's leading producer of apples and cherries and the second largest producer of pears and beans. A representative sampling of farmworkers migrating to New York State was thus obtained through interviewing Wayne County workers.

Due to the transitory nature of migrant farmwork and the difficulty of locating migrant families, a special sampling technique was developed (Chi, 1985). Addresses of migrant camps were obtained from the New York State Department of Health, county Cooperative Extension agents, migrant children census takers and other workers in local agencies who were familiar with the migrant population. It was then assumed that this information defined the total migrant population in Wayne County on October 21, 1982, a population of 1939 adults. On the assumption that the sampled migrants had characteristics similar to those of migrants enumerated on October 21, the interviewed migrants can be considered a representative sample of total migrant workers in Wayne County on that day. The interviewed migrants were an 11.2 percent sample of migrant farmworkers thought to reside in the county on that day.

The majority of the farmworkers interviewed were male (77 percent). These farmworkers were predominantly black, native born Americans. The racial composition of the sample was 96 percent black, 2 percent Hispanic and 2 percent white. The countries represented by non-native born farmworkers are Barbados, Guatemala, Haiti, Jamaica, and St. Lucia.

It is interesting to note that farmworkers interviewed include groups of workers traditionally considered unproductive, i.e., post-retirement age workers. The farmworkers ranged in age from 18 to 70 years with the mean age of 35 years.

Somewhat surprising were the socio-demographic statistics on the farmworkers' educational investments and years of experience in farmwork. There were farmworkers with no formal investments in education; other farmworkers had achieved college educations. The mean educational investment for the farmworkers examined in the following analysis was nine years. The workers also indicated a significant degree of commitment to farmwork. The maximum number of years of farmwork experience was 50 years; mean years of work experience was 12 years.

The data obtained on weekly wages was consistent with the previously cited statistics on earnings. Mean weekly wages earned was $176.22.

These farmworkers had varying degrees of access to health investment opportunities. Only 13 percent of the farmworkers had insurance coverage through Medicaid. The transitory nature of migratory farmwork limits their access to this state and federally funded health program. Thirty-five percent of the workers indicated that they had some form of private health insurance coverage. Migrant farmworkers additionally gained access to health services investment opportunities through the provision of health services in federally subsidized migrant health clinics that provided services at significantly reduced fees. There is one such federally funded clinic in Wayne County in the township of Sodus. A significant percentage of the workers surveyed (45 percent) lived in this township. Other farmworkers faced a travel distance of 7 to 20 miles to obtain access to this clinic.

III. Empirical Specification and Model Hypothesis

The empirical estimates are of the following two-equation system:

$$\text{LNWAGE} = a_0 + a_1\text{ED} + a_2\text{HEALTH} + a_3\text{EXP} + a_4\text{TYPEWK} + a_5\text{PAYRATE}$$

$$\text{HEALTH} = b_0 + b_1\text{ED} + b_2\text{AGE} + b_3\text{LNWAGE} + b_4\text{FRINGE} + b_5\text{MARITAL} + b_6\text{SEX} + b_7\text{INSURE} + b_8\text{DOCS} + b_9\text{CLINIC}$$

where: LNWAGE = log of weekly wages

ED = years of formal education

HEALTH = an index of health capital investment

EXP = years worked in farming

TYPEWK = dummy variables for type of work; = 1 if pick apples, or if pick other types of fruit (non-picking jobs excluded)

PAYRATE = work according to an hourly or piece rate system; = 1 if paid by the hour

AGE = age at last birthday in years

FRINGE = number of fringe benefits offered by employer

MARITAL = dummy variable for marital status; = 1 if married

SEX = 1 if male

INSURE = dummy variable for insurance coverage; = 1 if Medicaid or if private insurance (no insurance excluded)

DOCS = 1 if within the past 12 months the worker made a preventive care visit to a doctor

CLINIC = 1 if residing in township with the migrant clinic

The first equation predicts the effect on farmworker productivity of human capital investments (education, experience and health) controlling for the effects of differences in production technology. The second equation represents the demand for health capital investment. It predicts the effect on investment of increases in either the costs or benefits of investment. The system of equations was estimated using a two-stage least squares procedure.

A. Endogenous Variables

Weekly wages are utilized to formulate the dependent variable in the first equation because no direct measure of individual worker productivity was available for all farmworkers in the sample. The ideal measure of productivity would be a standard measure of product harvested/processed per week. Although this information is available for piece-rate workers, it was not available for hourly workers.

For piece-rate workers the weekly wage equals the number of units harvested/processed by the worker during the week preceding the survey times the wage rate per unit. This measure should be highly correlated with worker productivity. For hourly workers, the weekly wage equals the wage per hour times the number of hours worked. According to the assumption that employers adjust hourly wage rates to a level consistent with a worker's marginal product, the weekly wage provides a proxy measure of productivity for hourly workers. The bias incorporated in this measure of productivity is limited in that hourly workers represent only 15 percent of the sample. The weekly wage variable is specified in log form. This is to indicate that the equation represents the estimation of a production function. Thus production is assumed to be a function which increases at a decreasing rate.

The health capital variable is measured by an index of health. It incorporates the recognition that the health of the individual is determined by both his psychological and physical health. Furthermore, psychological and physical health are not independent. Using principal components analysis a health index was developed which incorporates a measure of psychological health (index of general well-being) and a self-assessed measure of health (how the worker compared his health with that of others of the same age).

Specifically, three variables were used to develop the index: the general well-being score (GWB) and two dummy variables: HEALTH1 (=1 if the worker said his health was the same or worse than others his same age) and HEALTH2 (=1 if the worker said his health was worse). Principal components analysis was utilized to develop weights on these three variables and thus to determine each worker's health index value. The health index was defined as (0.99982) (GWB) - (0.00308) (HEALTH1) - (0.00572)

(HEALTH2). Thus if a worker evaluated his physical health as better than average, his health index score would be approximately his general well-being score. A worker with average health would have a health index score approximately equal to his general well-being score minus 0.00308; a worker with poor health would have a total reduction of approximately 0.0082 from his general well-being score. The minimum value of the health index is 29.99; the maximum is 106 and the mean is 77.5. Larger values of the index imply the farmworker's overall health is superior.

B. Exogenous Variables

In equation 1, weekly wages are determined by the human capital variables education, experience and health. It is hypothesized that as investments in human capital increase, farmworker weekly wages should also increase. Both education and experience increase the amount of knowledge held by workers and thus increases their earnings potential. Health capital investments increase farmworkers' healthy production time. Investments should lead farmworkers to be more productive and thus to obtain larger wages. Investments also increase the number of healthy days the worker is able to contribute to earnings production. Additionally, since productivity is influenced by the type of work performed (the technology of the production) and the payment system used (piece-rate vs. hourly), these two variables are included as exogenous influences on weekly wages. While piece-rate wages encourage farmworkers to work rapidly, hourly reimbursement encourages a slower pace (Martin, 1985).

Farmworkers can be thought to demand some optimal quantity of health capital investment. Equation 2 describes the variables which influence this decision as depicted in Grossman,(1972). Optimal investment occurs when the present value of marginal benefits from gross investments in health equal the present value of marginal cost of those investments. The larger the marginal benefits and/or the lower the marginal costs, the greater the quantity of health investments.

The marginal benefits of health capital investments increase as worker wages increase. If health investments increase healthy production time, the monetary gains from more healthy time are larger the higher the wage.

Researchers have found that women tend to utilize medical services more frequently than men. In addition to the observation that women have higher utilization due to the use of obstetrical and gynecological services, another explanation used to explain differences in use is that men are more likely to make life style choices (smoking, drinking, etc.) which lead them to evaluate medical services as having only a small marginal impact on health levels [(Sindelar,1982), (Marcus,1982)]. Thus women perceive a larger marginal benefit of health investments.

The marginal cost of health investments depend in part on how health capital is produced. Grossman contends that health capital can be produced by expenditures on either medical services or other health producing goods (eg. food, clothing, housing) and by the use of the worker's time. The marginal cost of investments are thus lower when the worker faces a lower price of either medical services, other health producing goods or time. This research does not include a direct measure of the price of medical services or of other goods. However, the variables insurance coverage, previous preventive care services utilized and non-wage income (fringe benefits) serve as proxies for these price effects. Insurance coverage decreases out-of-pocket payments for medical services and thus decreases the worker's perceived price of medical services. Previous use of preventive care services reduces the expenditures on medical services necessary to produce health. Thus the price of an investment should be lower for those with prior use of preventive care. Increases in non-wage income increase the real spending power of the worker and the perceived price of all health producing goods should be lower.

The marginal cost of the health capital investment depends additionally on the efficiency of the worker in producing health. The more efficient the worker, the lower the marginal cost of the investment. Education, another human capital investment, should have a positive effect on the efficiency of production of not only earnings but also of health capital. A married farmworker can produce health capital with own-time inputs, as well as , with the spouse's time. Married farmworkers should thus be more efficient in the production of health capital. Older workers face a higher depreciation in their health capital and thus should be less efficient producers of health capital.

IV. Empirical Results

The two-stage least squares estimates for this system of equations are presented in Table 1. These results provide support for the health as a human capital investment approach. They also provide an interesting contrast of the relative roles of education and health capital as human capital investments. Of the three types of human capital investments health capital is the only one that significantly influences the weekly wage. For migrant farmworkers this seems to imply that if human capital investments only increase the knowledge of the worker, the investments may not lead to greater earnings potential. However, if the investments can increase productive work time, earnings potential increases.

How might the incentive for human capital investments be increased? Factors which increase the efficiency of health production or the worker's perceived price of either medical services or other health producing goods will lead to an increase in human capital investments.

The wage rate is insignificant in affecting the human capital investment. However, these results provide at least weak support for the hypothesis that increased wages increase the worker's perceived benefits from investments in health capital. It should also be noted that while benefits from health investments may be generated for farmworkers, higher wages imply that the opportunity cost of lost work time (due to time devoted to consumption of medical services) also increases. This later consideration implies that, for some workers, increased wages lead to lower health investments because the expected cost of health investments outweigh the expected benefits.

The positive and significant coefficient of the AGE variable is in direct contrast to the predictions of the model. If age increases depreciation of health capital, older workers were predicted to have less incentive to make investments. This positive coefficient may result due to the inclusion in the health capital variable of both a physical health component and a mental health component. Age may decrease the incentive to invest in physical health, although the incentive to invest in mental health may increase.

While the effect of education in the wage equation was insignificant, educational investments indirectly influence the earnings potential of the worker through increasing the efficiency with which the worker can produce health capital. This result is as hypothesized. Similarly the other health capital efficiency variable, MARITAL, is positively signed and significant. Thus the spouse's time contribution in the production of health leads the family to be more efficient in health production and to make greater investments in health.

The fringe benefits available to migrant workers include housing, utilities, transportation, cash bonuses, free or discounted commodities and food. The greater the fringe benefits available to migrant workers, the more earned income available for the purchase of health producing goods, the greater the investment in health capital.

The results indicate that insurance coverage through private insurance is more likely to increase the health capital investment than insurance through Medicaid. Although Medicaid may reduce the price of medical services, the access to medical service providers is more limited through this program than when there is coverage by a private policy. Medicaid patients are limited to the use of providers that accept Medicaid patients. The transitory nature of farmwork may provide an impediment to knowledge of accessible providers.

The migrant farmworker appears uniquely different from a general population sample. For this group it appears that men face a relatively larger marginal benefit of investment in health capital.

Preventive health care investments were predicted to increase the incentive of farmworkers to invest in health capital. The results for the variable DOCS does not support this hypothesis; the coefficient has the opposite sign from that predicted and is statistically insignificant. The hypothesis is weakly supported by the positive, yet insignificant coefficient of the CLINIC variable.

V. Implications

The results of this analysis have direct policy implications. Farmworkers have both the ability and incentive to increase their earnings potential through investments in health capital. Investments in health lead to increased wages and an ability to break a cycle of poverty.

Current policy has systematically addressed the educational and housing needs of migrant families. There are legal requirements for formal education investments for migrant children and there is regulatory law requiring employer provision of housing for

migrant families. Policy which focuses on the direct provision of health services is more fragmented. States of migrant farmworker employment have varying levels of commitment to the welfare, in particular health care, of transient residents. Thus there is no standard state contribution to the financing of health care services for migrant farmworkers. Federal efforts in financing health care services for migrant farmworkers are tied to state initiatives. This leads to a diverse set of offerings of health care at the state level.

For example, in New York State migrant health services may be funded by the federal Public Health Service (the primary Funding source), the State Department of Health and/or the State Education Department. Federal funds have been used to provide primary medical and dental services in three clinics dispersed across New York State. The children of migrant workers receive nursing services at day care centers through funds provided by the Health Department. Additionally the Health Department provides supplemental funds to federally funded clinics. This funding varies across clinics. Finally, the Department of Education subcontracts with various migrant clinics to provide medical and dental services for school age children of migrant workers.

Medical service provision to migrant farmworkers centers around migrant clinics. Availability of medical services in these clinics is sensitive to the size of the federal allocation of funds. Recent budget cuts in federal funding for clinics have led to reductions in the types of medical services provided by such clinics. The clinics may also be a significant distance from workers and thus lead to an access barrier. As discussed earlier, the lack of effect of wages in the health capital equation suggests that there may be a high level of time costs associated with these distances preventing use of these clinics.

The empirical results presented above indicate that private health insurance coverage is significant in increasing the probability of a health capital investment and even more significant than coverage under

Medicaid. Thus, a beneficial system of access to medical services would be one that provided the farmworker with continuity of care, similar to that provided by private health insurance.

An alternative approach to medical service financing would be a health service voucher system financed by a pooling of state and federal resources. The provision of a health service voucher acknowledges that migrant farmworkers are a special population group for whom traditional insurance arrangements may not serve as routes of access to health care. While private health insurance coverage is effective in enhancing health capital investments, it is unavailable to most farmworkers. On the other hand, Medicaid is more readily available, yet ineffective. A health service voucher system would provide farmworkers with the ability to utilize services that are located in each of their townships of residence during the farmwork season. Vouchers would allow better access to health care services and leave the decision to the farmworker as to when, where and what health care services are obtained.

Future research on health capital investments would be greatly enhanced by the development of a direct measure of worker productivity and better measures of worker health. Indeed a measure of worker productivity might be more easily developed for a migrant farmwork population. Such a measure of worker productivity for migrant fruit and vegetable pickers/packers would entail assessment of the amount of crop harvested/processed per production week. This measure would be developed for both piece-rate and hourly workers. Measurements of health capital are not as easily assessed. An appropriate measure would account for physical ailments, mental well-being and social aspects of health, as well as the worker's own assessment of his health. The results of this analysis are preliminary and descriptive of a particular group of migrant farmworkers-- predominantly black farmworkers in an Upstate New York County. Other geographic regions of New York State, as well as regions outside the state may have different migrant farmwork populations. The health capital investments of these groups should also be examined.

Table 1. Two-Stage Least Squares Estimates of the Weekly Wage and Health Capital Equations

Weekly Wage Equation:

Variable	Coefficient	t statistics
HEALTH	0.024	1.35*
ED	0.021	0.51
EXP	0.002	0.02
PAYRATE (1 = hourly)	0.047	0.07
TYPEWK1 (1 = apple picker)	0.551	0.84
TYPEWK2 (1 = other fruit picker)	-1.40	-1.99**

N = 172
F = 4.579
$R^2 = 0.11$

Health Capital Equation:

Variable	Coefficient	t statistics
LNWAGE	1.175	0.51
AGE	0.266	2.56***
ED	0.889	2.32**
MARITAL (1 = married)	6.818	2.71***
FRINGE	1.651	2.13**
INSURE1 (1 = Medicaid)	1.442	0.41
INSURE2 (1 = other insurance)	4.96	1.91*
SEX (1 = male)	5.10	1.67*
DOCS	-1.07	-0.65
CLINIC	0.976	0.34

N = 172
F = 3.746
$R^2 = 0.138$

---

*significant at the .10 level (one-tail test)
**significant at the .05 level
***significant at the .01 level

Bibliography

Bartel, A. & P. Taubman. (1979). "Health and Labor Market Success: The Role of Various Diseases," Review of Economics and Statistics.

Becker, G. (1964). Human Capital, Columbia University Press, New York.

Berkowitz, Fenn and Labrinos. (1983). "The Optimal Stock of Health With Endogenous Wages," Journal of Health Economics, 2(2).

Chi, P. (May, 1985). "A Note on Sampling Migrant Farm Workers," The Rural Sociologist, 5(3).

Goldfarb, R. (1981). A Caste of Despair, Iowa State University Press, Ames.

Grossman, M. (1972). The Demand for Health: A Theoretical and Empirical Investigation, Columbia University Press.

Grossman, M. and L. Benham. (1974). "Health, Hours and Wages," in Mark Perlman (ed.), The Economics of Health and Medical Care, IEA Conference, Tokyo, Halstead Press.

Luft, H. (February, 1975). "The Impact of Poor Health on Earnings," Review of Economics and Statistics, 57.

Marcus, A. and J. Siegel. (1982). "Sex Differences in the Use of Physician Services: A Preliminary Test of the Fixed Role Hypothesis," Journal of Health and Social Behavior, 23.

Martin, P. (March, 1985). "Seasonal Workers in American Agriculture: Background and Issues," Research Report Series, RR-85-04, National Commission for Employment Policy, Washington.

Mincer, J. (1974). Schooling, Experience & Earnings, National Bureau of Economic Research, New York.

Sindclar, J., (1982). "Behaviorally Caused Loss of Health and Use of Medical Care," Economic Inquiry, 20.

Ware, J.E., et al. (1982). Conceptualization and Measurement of Health in the Health Insurance Study, Vol 1, Model of Health and Methodology, Santa Monica, California: The Rand Corporation.

"Economic Rewards for Migrant Farmworkers in New York State"

By

Peter S.K. Chi

Presented at the annual meeting of Rural Sociological Society, Columbus, Ohio, August 19-21, 1991.

Abstract

This research focuses on determinants of wages and fringe benefits in a representative sample of migrant farmworkers randomly drawn in Orange County, New York, during the summer of 1986. The results of the regression analysis indicate that both institutional and human capital variables are significant determinants of weekly wages for migrant farmworkers but that institutional variables are, in general, more important than human capital variables.

Farm employers have historically provided hired farmworkers with a variety of perquisites, ranging from housing and transportation to garden lots. The stepwise regression is used to test the "equalizing differences" hypothesis, which states that higher fringe benefits may be partially offset by lower wages. The results indicate that farm employers do not use fringe benefits as a substitute for current wages. The reasons for this unique finding are discussed in the paper.

Migrant farmworkers are a fundamental component of the rural agricultural economy. They provide a labor supply at relatively low cost for agricultural production and manufacturing, and a low cost of labor is essential for the survival and expansion of the food industry. At the same time, all reports on the living and working conditions of migrant farmworkers have indicated that they are ill-housed and undernourished (U.S. Senate, 1969, Miller, 1972, Chi, 1991). Studies of their health situation have shown that migrant farmworkers are in a poor state of health and, in general, receive little medical care (Hassinger and Whiting, 1976; Bleiweis et al., 1977; Slesinger and Cautley, 1981; Chi, 1985). Moreover, their occupation, agricultural work, is the third most hazardous in the country, after mining and construction. Not only is work on the farm subject to a high incidence of accidents but also the continuous exposure of workers to pesticides furnishes another serious health hazard.

Another salient feature of migrant farmworkers' lives is political powerlessness. Migrants are socially and economically isolated from the communities through which they pass; their seasonal mobility makes them unable to meet the residency requirements that would entitle them to the health, education and welfare services available to permanent residents. Migrant farmworkers are, in fact, excluded from much of the worker-protective legislation that other American workers take for granted (Shenkin, 1974).

Another factor in migrant farmworkers' lives has been uncertainty about future employment in farmwork. Formerly noted for its reliance on intensive labor, the agricultural industry today is increasingly dependent on the use of machinery to plant, cultivate and harvest crops. Mechanization in agriculture reduced the need for seasonal farm labor by approximately 30 percent in the 1970s (U.S. Dept. of Labor, 1971). However, there is evidence that, with a higher proportion of produce being sold directly to consumers and regional produce markets, the demand for farm labor to harvest the numerous nonmechanized crops is stabilizing (U.S. Bureau of the Census, 1983).

At the same time, the supply of farm labor has been greatly influenced by immigration of foreign labor. U.S. immigration policies have, in the past, created the net effect of producing an oversupply of labor, which has directly and negatively affected the power of migrant farmworkers to bargain collectively for fair wages and decent working conditions (Glover, 1983; Briggs, 1985). Since migrant farmworkers are poorly organized and have to work in a competitive labor market, it is understandable that they have become an underpaid and underemployed group. Their compensation is provided primarily through hourly wages and piece rates, which vary greatly by type of crop, work experience and region.

In a general analysis of rural labor markets, Marshall (1974) suggests that the problems of migrant farmworkers are caused by the structure and nature of agricultural employment. As a result of tenant farm displacement and the loss of smaller farms, many blacks and Hispanics came into the regional migration streams. Black and Hispanic migrant farmworkers experience discrimination because of their race and low status work. Work is intermittent, and many farmworkers have difficulty obtaining services or adequate living conditions.

Facing similar adversities in a highly competitive and hazardous job market, some migrant farmworkers may be more productive than others in their efforts to obtain higher economic rewards. Since wages and fringe benefits are the major forms of economic returns, variation in weekly wages and fringe benefits among migrant farmworkers is the major focus of this study.

Data

This study is based on data obtained from the New York Migrant Health Interview Survey conducted in Orange County, New York in the summer of 1986. In order to obtain a representative sample of migrant farmworkers from which to collect health information and other related statistics, a special sampling procedure was designed for this survey. The first step was to compile a comprehensive list of addresses for all migrant camps and other migrant housing units in Orange County. All units on the list were stratified according to the size of maximum capacity. The total number of migrants that could be accommodated in each size category was known. A representative sample of 246 migrants was randomly drawn through a three-stage sampling procedure form all size categories (the sample size was determined by budget constraints). Special efforts were made between August 20 and 22, 1986, to find out from owners of migrant camps and other housing units how many migrant workers were actually living in the units. On the assumption that sampled migrants had characteristics similar to those of migrants enumerated between August 20 and 22, the interviewed migrants can be considered a representative sample of total migrant farmworkers in Orange County during the three days. The detailed sampling procedure has been described elsewhere (Chi, 1985).

Although 246 migrant farmworkers were randomly selected for this study, not all respondents answered every question in the questionnaire and some missing values may appear in the analysis. For accuracy, we presented the valid number of cases separately for different analyses.

Theoretical Framework

In the literature, the determinants of differential rewards for individual workers are usually analyzed according to two general approaches, institutional and human capital. The institutional approach centers primarily on the importance of institutionally determined inequality of opportunities. It also recognizes the role of ability, chance and risk-taking. Because its emphasis is on the relationships between earnings and a variety of social-environmental factors, the institutional approach has contributed to applied statistical analysis of income distribution. Such institutional and demographic variables as age, sex, race, ethnicity, location, family wealth and socioeconomic status have been used as independent variables in multivariate analyses of individual income differences (Adams, 1958; Hill, 1959; Morgan et al., 1962; Jencks et al., 1972; Duncan et al., 1972).

Another version of the institutional approach is to view differential ability as an important determinant of differences in productivity, which, in turn, is related to wage differentials. However, it was found that the distribution of abilities was not the same as the distribution of earnings (Pigou, 1920). In some recent studies, therefore, individual ability was therefore used as an additional variable to explain residual variation in income distribution, after institutional and demographic variables were statistically controlled (Roy, 1950; Adams, 1958; Jencks et al., 1972; Duncan et al., 1972).

A third version of the institutional approach is the dual labor-market theory, which explains differential economic rewards in structural terms as an outcome of the creation of different labor-market sectors (Edwards et al., 1975; Beck et al., 1978). According to the theory, the labor market is divided into primary and secondary sectors that are characterized by different labor-force conditions. Primary sector jobs are represented by relatively high wages, good working conditions, excellent chances for advancement and long-term employment stability. Secondary sector jobs tend to be low paying and to have poor working conditions, little chance for advancement and no employment stability. Primary workers will not seek jobs in the secondary market, while secondary workers will find it difficult, if not impossible, to move into the primary sector.

In contrast, the human capital approach singles out individual investment behavior as a basic factor in explaining variation in labor incomes. Differences in wages are due strictly to differences in productivity. Variation in productivity is a direct result of different levels of investment in human capital factors, i.e., education, health, training and work experience (Becker, 1964; Mincer, 1974). Thus, the only barriers to occupational mobility and higher wages for workers derive from limitations imposed by workers' levels of education, health, skills and experience.

This study attempts to incorporate both institutional and human capital approaches into an empirical model. Since migrant farmworkers usually engage in low paying, temporary jobs under hazardous working conditions, seasonal farmwork can be characterized as secondary sector jobs. Differences in earnings within the same sector are much smaller than those between primary and secondary sectors. Further, since migrant farmworkers are subject to similar labor-force conditions, the dual labor-market theory may have limited power in explaining variation in wages among them. Therefore, we hypothesize that the weekly wages of migrant farmworkers are primarily determined by a set of human capital variables as well as selected institutional factors.

Farm employers have historically provided hired farmworkers with a variety of perquisites, ranging from housing and transportation to garden lots. These fringe benefits have furnished noncash income to many migrant farmworkers. In the literature, the "equalizing differences" hypothesis was developed to test the relationship between wage earnings and fringe benefits. This hypothesis states that higher fringe benefits may be partially offset by lower wages (Schiller and Weiss, 1977). That is, current wages may be reduced in order to pay for more fringe benefits. In this study, we will directly test this hypothesis of a negative relationship between weekly wages and number of fringe benefits received.

Empirical Specification

In our multiple regression model, weekly wages are hypothesized to be determined by the human capital variables -- education, work experience and health, and by the institutional variables -- pay structure, sex, race and ethnicity. According to the human capital theory, as investments in human capital increase, farmworkers' weekly wages should also increase. Both education and work experience increase the amount of knowledge held by workers and thus increase their earning potential. Capital investments in health increase farmworkers' production time and should enable them to be more productive and thus to obtain higher wages (White-Means, 1987).

According to the institutional approach, weekly wages of migrant farmworkers may be affected by some institutional constraints. For instance, it has long been recognized that productivity in farmwork is influenced by the payment system (hourly rate vs. piece rate): piece-rate wages encourage farmworkers to work rapidly, while hourly reimbursements encourage a slower pace (Martin, 1985). Since farmwork is physically demanding, it is not unreasonable to expect that women may be less productive than men, and as a result, may receive lower wages. Since the migrant population in Orange County, New York is racially and ethnically diversified, some groups may possess a stronger work commitment than others and some may be more likely than others to experience discrimination in the work place. It is, therefore, expected that weekly wages of migrant farmworkers may be influenced by their racial and ethnic background, gender, and the payment system.

In this study, such a human capital variable as formal education is measured by the number of school years completed; farmwork experience is measured by the number of years worked as a farmworker, and health status, by the Index of General Well-Being (see Chi, 1986). The number of years worked for the same employer is used as a proxy for specific training which has no effect on the productivity of trainees that would be useful in other work situations (Becker, 1964). Pay structure, sex, race and ethnicity are treated as institutional variables that exist in the migratory labor market and may influence migrants' wage earnings. Both pay structure and sex are dichotomous variables (1 = hourly rate, 0 = piece rate; 1 = male, 0 = female, respectively). Race and ethnicity are treated as a set of dummy variables: blacks, Puerto Ricans, Mexicans, other Caribbeans (including Haitian, Jamaican, and immigrants from other Caribbean countries) and others (including whites and Filipinos). "Others," selected as the reference group, is the omitted category in the regression analysis in which black, Puerto Rican, Mexican and other Caribbean migrant workers are compared with the reference group.

Weekly wages were calculated in three steps: first, determining whether a respondent was paid by hourly or piece rate; second, ascertaining the basic pay rates and number of units (e.g., hours, bins or boxes) completed in the reference week; and finally, deriving weekly wages by multiplying the number of work units by the corresponding pay rates. Weekly wages are used to formulate the dependent variable in the model. This variable is specified in log form to indicate that the regression equation represents the estimation of a production function in which weekly wages are assumed to increase at a decreasing rate.

In his analysis of fringe benefits for migrant farmworkers, Dawson (1965) estimated that the value of fringe benefits in selected counties of New Mexico would amount to about 25 to 30 percent of the worker's cash wage. In the current study, respondents were asked to report whether they have received a set of 13 fringe benefits, but no attempt is made to estimate the monetary value of these benefits. The number of fringe benefits is used to measure the difference in perquisites.

Findings

Means and standard deviations of all variables used in the analysis are presented in Table 1. The respondents in the sample, on average, worked 12.55 years as farmworkers and nearly 4 years for the same employer. In general, they were poorly educated (mean years of education = 7.11) and received a low level of earnings (mean weekly wages = $190). Eighty-three percent of migrant farmworkers in the sample were paid at hourly rate; 17% at piece rate. A majority of migrant farmworkers were male (87%) and their racial and ethnic backgrounds were quite diversified: about 12% were blacks, 30% Mexicans, 33% Puerto Ricans, 18% other Caribbeans and 7% whites and Filipinos.

[Table 1 about here]

Of the 13 fringe benefits enumerated in the survey, the average number received by migrant farmworkers was 3.83. In examining each fringe benefit separately, over 94% of respondents reported that they had received free housing and/or utilities. The next most common benefit was a bonus or cash gift at season's end (60%), followed by loans and credits (50%), discounted rates on produce or commodities (36%), transportation allowance (30%), workman's compensation (27%), garden plots (23%), health insurance (21%), private disability insurance (19%), paid sick leave (8%), retirement benefits (4%), others (3%) and free meals (2%).

The results of the regression analysis are presented in Table 2. All except two variables are statistically significant in the model. More educated and healthier migrants tend to earn higher weekly wages than those who are poorly educated and less healthy. As expected, men tend to earn higher weekly wages than women in the farmwork market; migrants who were paid an hourly rate earned less than those paid at piece rate. When other variables are statistically controlled, blacks, Mexicans, Puerto Ricans, and other Caribbeans tend to earn less than the reference group (whites and Filipinos).

[Table 2 about here]

It is of particular interest to note that education is one of the significant determinants of weekly wages in such a secondary sector as migrant farmwork. In a low- paying job, where skill requirement tends to be minimal (this may be the reason why two work experience variables are not significant), why should education be a significant factor in explaining wage differentials? One possible explanation may be that educated migrant farmworkers are more knowledgeable about migratory seasonal markets than the less educated. The former group tends to find the job earlier and to seek better work first. Another reason may be that educated workers are more organized in their working process and, therefore, more productive than less educated migrants.

In the model, standardized β coefficients are used to determine the relative importance of significant independent variables. Based on the ranking of absolute values of β coefficients, it becomes apparent that institutional variables in general are more important than human capital variables in explaining variation in weekly wages among migrant farmworkers. Specifically, racial and ethnic background is the most important factor, followed by pay structure, gender, health status and education.

Using data on the earning histories and pension status of individual workers in 133 large firms, Schiller and Weiss (1977) found a negative relationship between pension benefits and current wages. Their result supported the "equalizing differences" hypothesis. However, our data indicate that no statistically significant relationship exists between weekly wages and number of fringe benefits received ($\gamma = .025$). In other words, farm employers do not use fringe benefits as a substitute for current wages. The different findings from these two studies may be attributed to two factors: first, Schiller and Weiss' work deals with primary sector jobs, while this study is concerned with migratory work in the secondary sector. The relationship between wage earnings and fringe benefits may be quite different in the two sectors. Second, pension benefits, as examined in Schiller and Weiss' study, may be viewed as deferred future income which enables individuals to reallocate their resources over time. The fringe benefits considered in this study are one-time rewards for current work well done and therefore, they may have a different relationship with wage earnings.

In order to explore possible determinants of fringe benefits for migrant farmworkers, the stepwise regression procedure was used to select significant variables out of all independent variables used in the previous model. The results in Table 3 indicate that farm employers tend to provide more fringe benefits to female migrant farmworkers who have worked for the same employer for a longer period of time. The findings further support the conclusion that fringe benefits for migrant farmworkers are add-on rewards for long-term loyal workers, particularly for female employees.

[Table 3 about here]

Conclusions and Implications

This research focuses on determinants of wages and fringe benefits in a representative sample of migrant farmworkers randomly drawn in Orange County, New York, during the summer of 1986.

The results of the regression model indicate that, while both institutional and human capital variables are significant determinants of weekly wages for migrant farmworkers, institutional variables are, in general, more important than human capital variables. Specifically, the structure of the wage payment is related to variation in weekly wages: Migrant farmworkers who are paid an hourly rate tend to earn less than those paid at piece rate. This finding seems to support the theory that the piece-rate system increases workers' productivity because employees can perceive a direct link between work effort and earnings (Ehrenberg and Smith, 1988). In other words, piece-rate workers may be more productive than hourly workers. However, only 13% of migrants in this study were paid by piece rate. In a previous study of the pay structure of migrant farmworkers in Wayne County, New York, White-Means (1987) found that 85% of respondents were paid at piece rate. The contrast of payment systems between these two migrant labor markets may be due to the fact that migrant farmworkers in Wayne County were predominately apple pickers, to whom the piece rate can be easily applied, while in Orange County many migrants were engaged in such jobs as pruning, spraying, weeding, processing or canning that are very difficult to quantify with any standard instruments. The hourly rate seems to be an appropriate means to compensate for this type of work.

On the one hand, the multivariate model indicates that men tend to earn higher weekly wages than women in the farmwork market. On the other hand, the stepwise regression shows that farm employers tend to provide more fringe benefits for female migrant farmworkers if they have worked for the same employer for a longer period of time. These findings seem to imply that lower earnings for women in farmwork may result from relatively lower productivity rather than from discriminatory treatment. If female migrant farmworkers had been discriminated against, they would not have received more fringe benefits than their male counterparts.

Although blacks, Mexicans, Puerto Ricans and other Caribbeans tend to earn less than the reference group (whites and Filipinos), the fundamental problem seems to be low weekly wages for migrant farmworkers as a whole (mean weekly wage = $190, see Table 1). Since "public policy in the United States has been tolerant of lower employment standards in agriculture" (Mamer, 1984), migrant farmworkers, unlike industrial workers, do not have paid vacations and the employer does not assume the risk of time lost due to inclement weather or equipment breakdown, the farmworkers pay for lost time by earning less, particularly under the piece-rate system (Fujimoto, 1969). The recently passed Immigration Reform Act, which penalizes farm owners for employing undocumented aliens, may have the potential to increase the wage scale for domestic and legal immigrant farmworkers although special assistance is also needed to help them obtain nonagricultural jobs during off-harvest seasons.

Given the low average wage found in this study, the distribution of migrant weekly wages is quite disperse, ranging from $59 to $732. Variations in productivity and differences in work commitment may account for some degree of wage differentials. Therefore, an alternative strategy, in contrast to depending on immigration policy to protect domestic workers, is a policy of investment in human capital. Various educational and training programs will make migrant farmworkers more health-conscious and more economically productive.

Reference

Adams, F.B. (1958). "The size of Individual Incomes: Socio-Economic Variables and Change Variation," Rev. Econ. States, November.

Beck, E.M. et al. (1978). "Stratification in a Dual Economy: A Sectoral Model of Earnings Determination," American Sociological Review 43(5).

Becker, G.S. (1964). Human Capital: A Theoretical and Empirical Analysis With Special Reference to Education, New York: National Bureau of Economic Research.

Bleiweis, P. et al. (1977). "Health Care Characteristics of Migrant Agricultural Workers in Three North Florida Counties," Journal of Community Health 3(1).

Briggs, V.M. Jr. (1985). "Employment Trends and Contemporary Immigration Policy," in N. Glazer (ed.) Clamor at Gates: The New American Immigration, San Francisco: ICS Press.

Chi, P.S.K. (1985). "A Note on Sampling Migrant Farmworkers," The Rural Sociologist, 5, 158-162.

Chi, P.S.K. (1986). "Variation in Subjective Well-being Among Black Migrant Farmworkers in New York," Rural Sociology, 183-189.

Chi, P.S.K. (1991). "A Tale of Two Homes: A Study of Housing Conditions of Migrant Farmworkers," Housing and Society, 18(2).

Duncan, O.D. et al. (1972). Socioeconomic Background and Achievement, New York: Seminar Press.

Edwards, R.C. et al. (eds). (1975). Labor Market Segmentation, Lexington, Mass.: Heath.

Ehrenberg, R. and R. Smith (1988). Modern Labor Economics, Glenview, Illinois: Scott Foresman and Company.

Fujimoto, I. (1969). "Mechanization and Farm Labor: Inequities and Social Consequences," in B.F. Cargill and G.E. Ross-Miller (eds.), Fruit and Vegetable Harvest Mechanization, East Lansing, Michigan: Rural Manpower Center, Michigan State University.

Glover, R.W. (1983). "Immigration and Agricultural Labor Policies," in Increasing Understanding of Public Problems and Policies, 1983, Oak Brook, Ill.: Farm Foundation.

Hassinger, E. and L.R. Whiting (eds.) (1976). *Rural Health Services: Organization, Delivery and Use* Ames, Iowa: The Iowa State University Press.

Hill, T.P. (1959). "An Analysis of the Distribution of Wages and Salaries in Great Britain," *Econometrics*.

Jencks, C. et al. (1972). *Inequality* New York: Basic Books.

Mamer, J.W. (1989). "Occupational Structure and the Industrialization of Agriculture," in R.D. Emerson (ed.), *Seasonal Agricultural Labor Markets in the United State*, Ames, Iowa: The Iowa State University Press.

Marshall, R. (1974). *Rural Workers in Rural Labor Markets*, Salt Lake City, Utah: Olympus Publishing Co.

Martin, P. (1985). "Seasonal Workers in American Agriculture: Background and Issues, *Research Report Series* RR-85-04, Washington, D.C.: National Commission on Employment Policy.

Miller, P.F. (1972). *To House the Migrant*, Geneseo, N.Y.: State University, College of Arts and Science.

Mincer, J. (1974). *Schooling, Experience and Earnings*, New York: National Bureau of Economic Research.

Morgan, J.N. et al. (1962). "The Anatomy of Income Distribution," *Rev. Econ. States* August.

Pigou, A.C. (1920). *The Economics of Welfare* New York: Macmillan.

Roy, A.D. (1950). "The Distribution of Earnings of Industrial Output," *Economic Journal* September.

Schiller, B. and R.D. Weiss. (1977). "Pensions and Wages: A Test for Equalizing Differences," paper presented at the annual meeting of the American Economic Association, Atlantic City, N.J., January.

Shenkin, B. (1974). *Health and Care of Migrant Workers: Policies and Politics* Cambridge, Mass.: Ballinger.

Slesinger, D. and E. Cautley. (1981). "Medical Utilization Patterns of Hispanic Migrant Farmworkers in Wisconsin," *Public Health Reports* 96(3).

U.S. Bureau of the Census. (1983). *1982 Census of Agriculture: Preliminary Report - New York*, Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor. (1971). *Rural Manpower Developments: Outlook for Seasonal Farm Labor in 1971*, Washington, D.C.: U.S. Government Printing Office.

U.S. Senate. (1969). "The Migratory Farm Labor Problem in the United States," *1969 Report of the Committee on Labor and Public Welfare* United States Senate, Sub-Committee on Migratory Labor: Washington, D.C.: U.S. Government Printing Office.

White-Means, S. (1987). "Migrant Farmworkers Earnings: A Human Capital Approach," *The Review of Black Political Economy* 15(4).

Table 1: Means and Standard Deviations of All Variables Used in the Analysis

Variables	Mean	Standard Deviation	N
I. Human Capital Variables			
1. Years of education	7.11	3.74	238
2. Years worked for the same employer	3.74	3.97	246
3. Years as farmworker	12.55	12.68	240
4. Health status (measured by the *Index of General Well-Being*)	56.75	12.08	227
II. Institutional Variables			
1. Pay structure (1 = hourly rate, 0 = piece rate)	.83	.38	246
2. Sex (1 = male, 0 = female)	.87	.33	246
3. Race and ethnicity			
Black (1 = yes, 0 = otherwise)	.12	.33	246
Puerto Rican (1 = yes, 0 = otherwise)	.33	.47	246
Mexican (1 = yes, 0 = otherwise)	.30	.46	246
Other Caribbean (1 = yes, 0 = otherwise)	.18	.39	246
Others (1 = yes, 0 = otherwise)	.07	.20	246
III. Dependent variables			
1. Weekly wages (in U.S. $)	189.72	84.97	211
* Log value of weekly wages	5.16	.41	211
2. No. of fringe benefits provided by employers	3.83	1.93	246

* Dependent Variable used in the regression analysis

Table 2: Regression Analysis of Weekly Wages (log value) For Migrant Farmworkers in Orange County, N. Y., 1986

Variables	Regression Coefficient	Standard Error	t	Standardized β Coefficient	Rank
I. Human Capital Variables					
1. Years of education	.0164	.0088	1.85*	.143	8
2. Years work for the same employer	.0005	.0073	.94	.005	10
3. Years as farmworker	.0026	.0026	.99	.076	9
4. Health status (measured by GWB)	.0060	.0026	2.33**	.161	7
II. Institutional Variables					
1. Pay structure (1 = hourly rate, 0 = piece rate)	-.296	.0960	-3.08***	-.228	5
2. Sex (1 = male, 0 = female)	.236	.0907	2.60**	.198	6
3. Race and ethnicity					
Black (1 = yes, 0 = otherwise)	-.431	.1579	-2.73***	-.307	3
Puerto Rican (1 = yes, 0 = otherwise)	-.327	.1460	-2.24**	-.366	1
Mexican (1 = yes, 0 = otherwise)	-.275	.1432	-1.92*	-.292	4
Other Caribbean (1 = yes, 0 = otherwise)	-.351	.1475	-2.38**	-.332	2
Others (1 = yes, 0 = otherwise)	--	--	--	--	--
Intercept	5.053	.2302	21.95***	--	--

Mean of the dependent variable = 5.16
N = 185
F = 5.83***
Adjusted r^2 = .210

* $P < .07$
** $P < .05$
*** $P < .01$

Table 3: Stepwise Regression on Number of Fringe Benefits for Migrant Farmworkers in Orange County, N.Y., 1986

Step	Variable Entered	Regression Coefficient	Standard Error	F	Model R^2
1.	Years worked for the same employer	.087	.032	7.15^{**}	.042
2.	Sex	-.843	.360	5.50^{*}	.068
	Intercept	4.432	--	--	--

* $P < .05$
** $P < .01$

The Economic Returns From Investments in Physical and Mental Health: A Case Study of Migrant Farmworkers in Rural New York

by

Shelley I. White-Means

Printed in Journal of Health and Social Policy, 2(3), 1991

Abstract

Spiraling costs of medical care services and limited federal and state resources necessitate discriminating and cost-effective strategies for financing health care to indigent populations. Thus, while the selection among intervention strategies is aided by information on both the cost and benefits of program alternatives, data on the latter aspect is more difficult to obtain. Human capital research provides a mechanism for assessing one of the multifarious aspects of the benefits of medical services. Research suggests that labor market earnings opportunities are affected by health status. The present study explores this relationship for migrant farmworkers in a vegetable production county (Orange County) in upstate New York. Multivariate analysis indicated that mental well-being was an important predictor of earnings for migrant farmworkers. Directions for public health policy intervention strategies are also discussed.

Introduction

With costs of health care services spiraling and federal and state resources limited, the question of how best to provide access to medical services by indigent populations has become critical. The recent rebirth of vigorous discussions of the financing of national health insurance and the appropriate minimal level of access to health care for all United States citizens exemplifies this concern. The crux of the financing dilemma is captured in the question: "How do you allocate scarce resources across medical services/programs in such a way that an optimal quantity of health is generated?" The answer to this question has particular relevance for migrant farmworkers who are a select group of the indigent population but who have tended to be overlooked when broad-scale programs to provide adequate health care generally have been designed.

The Migrant Health Act of 1962 (PL 87-692) was the first federal effort to assure that migrant farmworkers gained access to health care services. The legislation was stimulated by an observation that their migratory status led states to have limited commitment to the health status of these workers who were typically excluded from Medicaid and had only inadequate and uncoordinated access to medical care. Additionally, it was recognized that the health of migrant farmworkers has broad-based external effects on the health of the population at large. For example, the incidence of tuberculosis, typhoid fever or diphtheria among members of the migratory work force could lead to national epidemics.

While the initial migrant clinic legislation (PL 87-692) facilitated access solely to preventive health care services, subsequent legislation (PL 94-63) provided access to diagnostic and primary, supplemental, and environmental treatment through subsidized migrant clinics. Primary health care includes: services of physicians, preventive health care, emergency medical care, transportation services, and preventive dental services. Supplemental health services, such as hospital, mental health, public health or health education services, are optionally provided through migrant clinics, but recent constraints in federal financing have led to the elimination of a number of optional services that were previously provided to migrant farmworkers through these clinics (Senate Report No. 100-343).

210

Whether optimal service provision decisions were made when migrant health centers faced a budget crisis is yet to be determined. Ideally, selection among alternative services should be based on both the relative costs and benefits of medical programs. Data on costs of programs are easily obtained. However, medical program benefits are difficult to assess because benefits are derived over varying lengths of time. Medical services have immediate effects on the health of medical recipients, as well as on the health of their families, friends, and others in the immediate community. At the same time, such services also generate long-term benefits. Several researchers have used human capital theory to generate and support the hypothesis that health investments (medical service use) increase the productivity and thus, the earnings of workers (Grossman 1972; Grossman and Benham 1974; Luft 1975; Bartel and Taubman 1979; Berkowitz, et al. 1983). However, the application of such findings to aid in designing optimal service programs has been limited.

The present study develops a framework for testing the general applicability of a human capital model for examining the economic and health situation of a select group of migrant farmworkers. Data from migrant farmworkers residing in migrant farm camps in an upstate New York county are used to examine the relationship between health and productivity. The results of this study provide some insights for making the optimal choices among alternative public health intervention strategies for migrant farmworkers.

Data and Measures of Variables

Primary Data Source

The data used in this study were obtained through on-site interviews of farmworkers who resided in migrant camps in Orange County, New York during the summer and fall of 1986. Orange County, which is predominantly a vegetable production region, has a large percentage of Hispanic farmworkers who process the area's crops. A three-stage, stratified random sampling technique was used to obtain a representative sample of workers according to residence in the camps. Details of the sampling procedure are set forth in Chi (1985) and White-Means, et al (1989).

A structured survey instrument was pretested in 1985 and used in the personal interviews during 1986. The data collected are unique in that new and formerly unavailable information was obtained on basic sociodemographic characteristics of the farmworkers, as well as their work effort, income, physical and mental health status and medical services utilization in both the county of migratory labor and the workers' home community. These detailed interviews were conducted with 246 migrant farmworkers, approximately 40 per cent of the total number of migrant workers reported by the county's vegetable and fruit growers.

Measures of Labor Productivity

Detailed information was obtained on the farmworkers' labor efforts and monetary returns. Workers were asked to estimate their hourly, daily and piece-rate earnings, the quantity of crop processed per hour (day), and the number of hours worked per day (week), as well as earnings by piece, hour or day. Thus, data for two alternative measures of productivity were available. The first, weekly wages, is a standard but indirect measure of production while the second, output per time period, is a direct measure.

Weekly wages are considered an appropriate proxy measure for productivity whenever labor markets are efficient. That is, profit maximizing firms are said to produce their output efficiently when laborers are rewarded a wage that equals their marginal productivity. Thus differences in productivity are captured by wage earnings. The specific measures used in the present analysis are (payment/unit processed * number of units processed/hour * hours worked/week) and (hours worked/week * payment/hour) for piece-rate and hourly farmworkers, respectively. The average weekly wage for our sample of migrant farmworkers is $ 212.03, based on information gathered from 223 of the 246 farmworkers sampled.

The second measure of productivity is pounds of output processed per hour. This estimate uses the farmworkers' self-reported data on the number of units processed per hour, self-reports on the type of container in which the output is placed, and the weight of the fully processed containers of fruits and vegetables. Specifically, the measure is (quantity of a particular crop that is placed in a specified container/hour * the weight of the container when filled with the specified crop).

Since the fruits and vegetables collected include apples, celery, lettuce, radishes, broccoli and onions, weight of container is used to facilitate comparisons of a processed output that is not homogeneous. Mean poundage processed per hour is 1201.68, based on information obtained from 54 farmworkers. The information is limited because many workers, particularly hourly workers, had difficulty in estimating their production activities-- a surprising problem because wage earnings of the workers depend on output processed.

Before multivariate analysis was applied, both weekly wages and output per hour were evaluated for their validity as measures of productivity. Human capital theory (Becker, 1964) suggests that age, education and experience are related to productivity. Older workers are postulated to have acquired more diverse skills and workers with specific training in a particular job are presumed to represent the most efficient workers. The predictions are that the skills and efficiency of workers will lead to enhanced productivity as will investments in human capital (as education is considered to be). Other evidence suggests that the structure of the wage payment system is related to worker productivity (Ehrenberg and Smith, 1988). It is thought that piece-rate systems increase productivity because employees can perceive a direct link between work effort and earnings. According to this theory, piece-rate workers should be relatively more productive than hourly workers.

Pearson correlation coefficients are used to evaluate the validity of weekly wages and output as measures of productivity. The results are presented in Table 1. While the results for the weekly wage measure are generally consistent with the predictions of human capital theory, those for the output measure are not. Specifically, education and piece-rate are statistically significant and of the correct sign relative to the weekly wage measure. On the other hand, the only variable whose correlation is statistically significant relative to output (lbs.) is piece-rate, but its coefficient is negative rather than positive. These results indicate that the best measure of migrant farmworker productivity is the weekly wage.

Measures of Health Status

Two measures of health status are used, general health perception and mental well-being. General health perception is measured by the farmworker's response to the question, "In thinking about other men (women) you know of your age, how would you compare your health with theirs?" The majority of farmworkers evaluate their health as about the same as others their age, as shown by the frequency distribution of responses to the health evaluation question:

much better		(10.6)
slightly better	(25.6)	
about the same	(45.1)	
slightly worse	(8.1)	
much worse		(2.0)
no response		(8.5)

The farmworker's mental health is assessed by an index of well-being. This index has been documented as a valid measure of mental health of farmworkers (Chi, 1986). Its values range from a minimum of 9 (indicating a low level of well-being) to a maximum of 77.5; the mean value is 57.234. A total of 199 farmworkers were assigned values.

Analytical Framework

Three approaches are used to evaluate the effects of health on the measure of productivity. First, a weekly wage regression is estimated as a function of traditional employment and human capital factors. Second, the role of each of the two health measures in determining weekly wages is examined separately. Finally, an index of several dimensions of health is developed and used to evaluate the total effect of health on weekly wages. A log-linear ordinary least squares regression model was used to estimate the determinants of farmworker productivity. This model assumes that weekly wages increase at a decreasing rate with changes in human capital or other factors affecting productivity (Becker, 1964). The estimated equation is

$$\log(\text{weekly wages}) = a_0 + a_1(\text{human capital factors}) + a_2(\text{other factors affecting productivity}).$$

Two human capital factors are initially considered: experience (number of years in farm work) and education. Although age is a factor traditionally considered in regression models of the determinants of weekly wages, it is not included in the regression model for migrant farmworkers. First, age and experience in farm work are highly correlated. Additionally, in the preliminary Pearson correlation, (Table 1) the sign of the correlation coefficient for experience was as predicted, while the sign of the coefficient for age was not.

Other variables hypothesized to affect productivity were the payment system (piece-rate or not), type of job performed (harvesting, picking, packing or not) and whether the farmworker did or did not engage in extended employment hours (at least 40 hours per week). The predicted sign of piece-rate is positive; working extended hours is expected to contribute to higher weekly wages. No specific prediction can be made for the expected sign of the type of job performed.

Results

Productivity and Traditional Employment Variables

Regression estimates for the traditional model are presented in Table 2. According to these data, four factors predominantly influence weekly wages: the payment system (piece-rate or not), whether the worker performs more than 40 hours of labor per week, the type of work and experience. Table 2 shows that piece-rate workers received higher wages. Similarly, those who work extended hours, are harvesters, pickers and packers and who have more experience in farmwork receive significantly higher weekly wages.

Productivity and Health (Individual Factors)

Preliminary bivariate analysis indicates a significant and positive correlation between general health perception, mental health, and farmworker wages, as shown by the following correlation coefficients (significance levels in parenthesis):

General Health Perception	Mental Well-being
0.133 (0.03)	0.121 (0.04)

Log-linear least squares regression is also used to investigate the effects of the two individual health factors on weekly wages. The results of the two regression models are presented in Table 2. Each health factor is added to the traditional weekly wage model to determine its influence on weekly wages when other factors affecting productivity are controlled.

The regression results indicate that the health factor that significantly affects weekly wages is mental well-being. Furthermore, the coefficient of determination (R^2) is larger than its value in the traditional weekly wage regression where health is measured by general health perception. Specifically, a simple two unit increase in the farmworker's mental well-being index (possibly obtained by the farmworker perceiving he is satisfied with his life rather than somewhat dissatisfied) leads to an increase in weekly wages of $2.02 per week. This change in weekly wages is comparable with the wage effects of piece-rate and extended hours of work: weekly wages increase by $4.22 if the worker is paid according to a piece-rate system and working extended hours increases weekly wages by $2.52.

General health perception, surprisingly, is not significant in the multivariate analysis. In the bivariate analysis, this factor had a positive, significant correlation with weekly wages. It is possible that the regression with the general health measure alone is biased because of specification error, i.e., an excluded variable problem. Measures of both mental and general health may be necessary to effectively evaluate the effect of health on wages of farmworkers. Since the high correlation between general and mental health prohibits the use of both measures in a single regression equation, a multidimensional health index was constructed to test this hypothesis.

Productivity and the Health Index

Using principal components analysis, it is possible to develop a multidimensional health measure that incorporates general health and mental well-being. The index is

$$\begin{aligned} \text{HINDEX} = {} & (0.61853 * \text{mental well-being}) \\ & - (0.69543 * \text{SAME HEALTH}) \\ & - (0.75178 * \text{POOR HEALTH}) \end{aligned}$$

where,

SAME HEALTH = 1 when the farmworker indicates that he/she perceives that his/her health is the same as or worse than that of others the same age (otherwise = 0), and

POOR HEALTH = 1 when the farmworker indicates that he/she perceives his/her health as slightly worse or much worse than that of others the same age (otherwise = 0).

Table 2 also presents the regression results, which indicate that the multidimensional health measure is significant at the 0.05 level. The relatively low significance level of this measure provides further support for the hypothesis that the most significant health factor influencing farmworkers' weekly wages is mental well-being.

DISCUSSION

The previous analysis was based on data obtained from a small sample survey of farmworkers who process vegetables in Orange County, New York. The results indicate that health influences the earnings potential of migrant farmworkers in that county. In particular, higher levels of mental well-being and of a composite measure of physical and mental health significantly increase the weekly wages of these farmworkers. The small sample size limits generalizing from these results. Nonetheless, the findings in this study are consistent with the author's previous study of black migrant farmworkers who process fruits in Wayne County, New York (White-Means 1987), as well as the previously cited studies of health and productivity for non-migratory populations (Grossman 1972; Luft 1975; Grossman and Benham 1974; Bartel and Taubman 1979; Berkowitz, et al. 1983).

This study illustrates the value of specifically examining the independent influence of mental health on labor market productivity. Investments in mental well-being can increase the earnings potential and quality of life for farmworkers. Several factors significantly contribute to low mental well-being scores for Orange County farmworkers. In the order of importance, these factors are (1) whether the daily life is full of things of interest, (2) general feelings (spirits), (3) whether relaxed or tense, (4) whether depressed or cheerful, and (5) the amount of energy available. It seems possible that efforts to modify any or all of these factors could not only increase the mental health of farmworkers, but also increase their wage earnings and life chances.

The most recent legislation that affects the funding of migrant clinics is the Community and Migrant Health Centers Amendments of 1988 (PL 100-386). This legislation authorizes a system of case-managed health care services for farmworkers to be provided through migrant clinics. This health care system entails designing services that meet the particular service needs of each farmworker and includes outreach, counseling, referral and follow-up. Furthermore, the legislation authorizes health centers to develop and request funding for "priority" supplemental services needed by farmworkers within a particular geographic region. These supplements may include services from the original list of services authorized in 1962 (e.g., home health, long-term care, mental health, and vision services), that were subsequently cut by many centers as a result of limited financial resources. Thus, the development of evaluation criteria for selection among medical programs is even more crucial than in previous periods. The results of the present study indicate that special programs focusing on mental health would be valuable for farmworkers in Orange County.

The use of research similar to that presented in this paper is one mechanism to identify supplemental services that should be assigned priority by clinics. Too often, the standard approach to identify priority service areas is to examine whether a medical treatment leads to an increase in health (Eastaugh, 1987). If it does meet this criterion, the identified treatment is a viable choice as a priority service. An alternative and more stringent criteria for public sector health investments in priority services would be to consider both direct and secondary effects of access to a particular health service. That is, one example of stringent criteria for priority assignment would be to determine whether the service will increase the health level of the worker and possibly spill over to the employment sector by increasing productivity and earnings potential. Because investments in medical service sectors that have multiple impacts on the life chances of farmworkers will have far-reaching effects, these sectors should receive high priority in the selection of services to be provided.

This paper provides a preliminary framework for assessing benefits of medical programs that extend beyond the benefits of acute care. A more comprehensive assessment of the value of investing in medical programs would consider benefits that are derived over the life course. For example, health investments made currently may enable farmworkers to maintain independence of various social programs over the long run. Data to examine this proposition are not available and unfortunately, the migratory status of farmworkers restricts the feasibility of collecting such data from this population. Alternatively, such an assessment might be addressed through surveys of resettled farmworkers (those who have changed their status from migratory to permanently settled state residents). A survey of this type would entail obtaining information on current physical and mental health, a medical history, and current dependence on social programs. In addition to providing information on the plight of migrant farmworkers, these data would be useful in assessing the external benefits to society gained through public investments in the health of migrant farmworkers.

References

Bartel, A. and P. Taubman. (1979). "Health and Labor Market Success: The Role of Various Diseases," Review of Economics and Statistics , February.

Becker, G. (1974). Human Capital. New York: Columbia University Press.

Berkowitz, M., P. Fenn and J. Labrinos. (1983). "The Optimal Stock of Health with Endogenous Wages," Journal of Health Economics, 2 (1): 139-147.

Chi, P. (1985). "A Note on Sampling Migrant Farm Workers," The Rural Sociologist, 5 (3): 158-162.

___. (1986). "Variation in Subjective Well-being Among Black Migrant Farmworkers in New York," Rural Sociology, 51 (2): 183-198.

Eastaugh, S. (1987). Financing Health Care. Dover, Massachusetts: Auburn House Publishing.

Ehrenberg, R. and R. Smith. (1988). Modern Labor Economics. Glenview, Illinois: Scott, Foresman and Company.

Grossman, M. (1972). The Demand for Health: A Theoretical and Empirical Investigation. New York:Columbia University Press.

Grossman, M. and L. Benham. (1974). "Health, Hours and Wages," in M. Perlman edition, The Economics of Health and Medical Care. New York: Halstead Press.

Luft, H. "The Impact of Poor Health on Earnings," Review of Economics and Statistics, 57: 43-57.

Senate Report No. 100-343. (1988). "Community and Migrant Health Centers Amendments of 1988," Congressional Record, vol. 134.

White-Means, S. (1987). "Migrant Farmworker Earnings: A Human Capital Approach," Review of Black Political Economy, 15 (4): 21-33.

White-Means, S., P. Chi, and J. McClain. (1989). "Health Status and Economic Productivity of Migrant Farmworkers in Orange County, New York," Final Research Report to Milbank Memorial Foundation.

TABLE 1. Correlations Between Selected Human Capital Variables and Measures of Productivity

Test Variable	Hypothesized Sign	Correlation Coefficient	
		(number of cases) (significance level)	
		Weekwage	Output (lbs.)
AGE	(+)	-0.0324	-0.0642
		(215)	(51)
		(0.32)	(0.33)
EXPERIENCE	(+)	0.0705	-0.0128
(# years in farmwork)		(213)	(49)
		(0.15)	(0.47)
EDUCATION	(+)	0.1167	0.1869
		(208)	(50)
		(0.05)	(0.10)
PIECE-RATE	(+)	0.5001	-0.2311
		(215)	(51)
		(0.00)	(0.05)

Table 2. Log-linear Regressions of Weekly Wages (t statistics in parentheses)

HINDEX Variables	Traditional	HEALTH/MODELS Model Health	General Health	Mental Well-being Perception
Education	0.009 (1.15)	0.008 (0.99)	0.006 (0.80)	0.007 (0.80)
Experience	0.003 (1.69)*	0.004 (1.73)*	0.003 (1.53)	0.004 (1.58)
Piece-Rate	0.630 (6.13)***	0.626 (5.74)***	0.625 (6.01)***	0.625 (5.63)***
Type of Work	0.105 (1.74)*	0.102 (1.59)	0.059 (0.90)	0.059 (0.10)
Extended Hours	0.384 (5.71)***	0.355 (5.00)***	0.402 (5.83)***	0.378 (5.18)***
General Health		0.039 (1.11)		
Mental Health			0.005 (2.00)**	
Health Index				0.008 (1.69)*
Sample Size	213	195	194	177
F	14.45**	10.70**	12.09**	10.22**
$\bar{R}^2$	0.24	0.23	0.26	0.24

(one and two tail tests used according to the hypothesis of the theoretical framework)

* significant at the 0.05 level
** significant at the 0.025 level
*** significant at the 0.01 level

The Poverty Status of Migrant Farmworkers

by

Shelley I. White-Means

I. Introduction

The U.S. migrant workforce that is responsible for low and stable food prices is also an impoverished labor force. Their incomes may not be sufficient to purchase food commodities that they harvest for the nation. A multi-generational cycle of poverty exists among these workers. Once affiliated with this labor market sector, it's very difficult for farmworkers and their families to shift to more prosperous earnings opportunities.

The poverty status of migrant farmworkers is well known. Numerous studies have documented estimates of the personal and family income of these workers (Fuller and Van Vuuren, 1972; Gardner, 1972; Larson, 1968; Lianos, 1972; Martin, Mines, and Diaz, 1985; Pollack et al., 1981; Smith and Coltrane, 1981; White-Means, 1987; White-Means, 1991; Whitener, 1985). However, beyond monetary estimates of the dollar value of income, our understanding of poverty and its implications for migrant farmworkers is limited. For example, reports of income focus of the average farmworker. Are there farmworkers who, despite their occupational classification, have incomes above the poverty level? If so, what factors are associated with their ability to escape a cycle of poverty? This paper provides answers to these questions by investigating the relationship between the poverty status of farmworkers in a vegetable production region of New York State and their human capital investments, family workforce composition, and social program access.

II. Data and Measures of Variables

Primary Data Source

The data source used in this study is the New York Migrant Health Status Interview. These data were obtained through on-site, detailed interviews of 246 farmworkers who resided in migrant camps in Orange County, New York during the summer and fall of 1986. A three-stage, stratified random sampling technique was used to obtain a representative sample of workers according to residence in the camps. Details of the sampling procedure are set forth in Chi (1985) and White-Means, et al. (1989). Approximately 40 percent of the total number of migrant workers residing in the community were interviewed. These workers provided information on their work environments, income, personal expenditures, health status, and family traditions, as well as other details about their lifestyles in their migrant work and home communities.

Measures of Poverty Status

Two objective measures of poverty status are used and contrasted in this manuscript. One is a standard, direct measure of household income and the other is an implicit measure that is based on food expenditures. The income measure is derived from the farmworker's choice of the income category that was "closest to the amount of their 1985 total household income." A continuous measure of income was derived from these responses by using the modal value of each category as the estimated measure of the worker's family income.

According to Engel's Law, the percentage of income allocated to food expenditures declines are income increases. A measure of poverty that was suggested by Watts (1967) and Hagenaars and de Vos (1988) is that a household is considered in poverty if more than one-third of its income is allocated to the purchase of food. Thus, the second measure of poverty status is based on the ratio of the worker's monthly family food expenditures divided by monthly income. If the worker has a ratio of 0.33 or higher, the worker is assigned poverty status. Otherwise, the worker "escapes" poverty.

III. Results

Poverty Status

Table 1 reports the 1986 national poverty thresholds according to family size as reported by the Congressional Budget Office. Additionally, the table reports mean income by family size for migrant farmworkers in Orange County and contrasts these reported measures of income with national thresholds. With the exception of the family size category of one, average income of farmworkers are lower than national poverty thresholds. Indeed, the extent of deviation between national thresholds and mean incomes for farmworkers increases exponentially with family size. These data report that farmworkers who maintain a single person household are the only group of workers who are able to outpace national poverty levels.

Table 2 reports farmworkers' poverty status according to the second objective measure; the food/income ratio. The percentage of farmworkers with monthly food expenditures exceeding one-third of their incomes are reported, according to family size. The results are similar to those found in Table 1. For every family size classification, a high percentage of farmworkers spend a large percentage of their income on food. Moreover, as family size increases, the likelihood of these types of food expenditures increases. In contrast to the assessments of poverty based on comparisons with national income thresholds, Table 2 indicates that no family size group escapes poverty status. However, somewhat surprising is the finding that in every family size classification, there is at least one family who escapes poverty.

Escaping Poverty Via Human Capital Investment

In Table 3, mean values of several human capital measures are reported, according to poverty status. The measure of poverty status used in this analysis is whether the worker spent more than one-third of his income on food. If so, the worker is classified as meeting poverty standards.

The human capital literature typically suggests that formal education enhances earnings opportunities. Education is found to significantly affect farmworkers' poverty status; the average years of formal education are 7.65 and 6.53 for above poverty and poverty status workers, respectively.

Four measures of work experience are presented in Table 3. These are years worked in New York, years in farmwork, years in other occupation, and age. Among these factors, only years worked in other occupations significantly influences poverty status. The average years of employment in an alternative labor market sector is 2.73 for farmworkers who escape poverty status, compared to 1.08 for workers in poverty. The maximum number of years of alternative sector employment is also interesting; 40 for workers who escape poverty and 24 for those in poverty. While not statistically significant, the data also indicate that poverty status workers have more years (on average) in farmwork than those escaping poverty.

Poverty and Health Stock

Farmwork is arduous and requires a significant amount of physical tenacity. In Table 4, we investigate the role of depreciation in the health stock of the worker and his ability to acquire income above poverty status. Workers indicated whether they had trouble climbing, bending/stooping, lifting, standing, or being out in the sun. The percentages of workers responding in the affirmative are presented in Table 4. In every case those workers with above poverty income were less likely to indicate that their health stock was impaired. However, a Chi-square test indicates that these differences are not statistically significant.

To further investigate this finding, a variable measuring the disability levels of the farmworkers was developed. It is the sum of affirmative responses to each of the five disability questions listed in Table 4. Both workers escaping poverty and workers with poverty status indicate that they have as few as zero disabilities or as many as five. The average number of disabilities for these workers are 0.849 and 1.039, respectively. Once again, t-test do not indicate that these differences are statistically significant ($t=-1.2279$; $p < 0.22$).

Poverty and Access to Social Programs

Table 5 presents data on farmworkers' access to various social programs that are considered as mechanisms to assist impoverished families. Our initial hypothesis was that farmworkers who were able to escape poverty may have greater access to community support systems. The results presented in Table 5 are quite surprising.

Farmworkers who escape poverty do not have greater access to all types of community support programs. Indeed for basic food and housing programs, those in poverty are slightly more likely to obtain program access. However, farmworkers in poverty are less likely to have access to AFDC, unemployment insurance, supplemental security income, and workman's compensation.

Poverty and Family Roles

When general descriptive information about why farmworkers are involved in migratory labor is evaluated, one notices that workers escaping poverty have different motivations for farmwork than those who are of poverty status. Table 6 indicates that workers who escape poverty are much more likely to choose this occupation because it allows them the best earnings option. On the other hand, workers in poverty status are more likely to seek farmwork because they have no other job or are unemployed/laid off. Thus for the later group, migratory farmwork is more likely to represent an option of last resort.

Workers who have escaped poverty also appear to have made better choices about the distribution of family labor market skills. Those escaping poverty have slightly less family members participating in farmwork [(1.23 vs. 1.33);$t=-1.1959$, $p < 0.23$] and significantly more family members participating in other types of nonfarm employment [(0.23 vs. 0.11); $t=2.213$, $p < 0.02$].

A Poverty Regression Model

In Table 7, logistic regression estimates are reported for a model of poverty status that seeks to identify the unique influences of human capital, family composition and social program access. The findings for the regression model are similar to the aforementioned bivariate results.

The most significant factors (significant at the .05 level or less) that influence poverty status are the farmworker's years of formal education, age, and whether or not the worker is able to obtain access to Type 1 public services. Workers with more formal education, who are older, and who have access to income subsidy programs have the highest probability of escaping poverty.

Factors that are marginally significant (.06 significance level) are also important to note. They are family members who are employed in the non-farm sector and access to food or housing public service programs. With more family members employed in the non-farm sector, the likelihood of poverty status declines. The results for access to food or housing programs are quite surprising; this type of program access is positively related to the probability of poverty status. We would predict that given access to these programs, farmworkers would be able to use their financial resources (earned income) to purchase non-food items. However, we find that even with access to these programs, farmworkers' incomes are insufficient to provide them access to commodities that are not used for the purposes of satisfying basic survival needs.

IV. Discussion

In this paper, we document the poverty status of a group of migrant farmworkers who reside in Upstate New York. There is significant poverty among these workers, with poverty varying according to the size of the worker's family.

The farmworker's human capital investment in formal education is essential for facilitating a process that allows the workers to breakout of multi-generational poverty cycles. These results emphasize the importance of tracking systems that provide farmworker's children with continuous access to public schools throughout the year.

Another important finding is that access to social programs is an insufficient criteria for farmworkers to break the poverty cycle. Particular social programs, those that provide income (rather than services) are most beneficial to workers. Indeed, access to some type of income subsidy program appears to provide workers with the flexibility necessary to effectively maximize their options in the utilization of scarce family resources.

With limited state and federal funds available for social programs, the plight of impoverished farmworkers is one among many of our national concerns. Yet, whether there is access to public programs for these workers is basically a question of when farmworkers are supported by the public sector. Due to the arduous nature of the work, migrant farmworkers eventually retire and permanently reside in particular states. With limited savings, retirement benefits, or support from their children (who similar to their parents may migrate on the farmwork stream to earn a living), these former farm workers are added to state public assistance roles. In later life they are laden with chronic medical problems that are expensive to treat. On the other hand, early intervention and public assistance for these workers could serve to minimize the state's long-term financial burden and assure these workers and their children greater independence and self-sufficiency.

REFERENCES

Chi, P. (1985). "A Note on Sampling Migrant Farm Workers," The Rural Sociologist, 5(3):158-162.

Congressional Budget Office. (1988). Trends in Family Income: 1970-1986.

Fuller, V. and W. Van Vuuren. (1972). "Farm Labor and Labor Market." Size, Structure and the Future of Farms, eds. A. G. Ball and E. O. Heady. Ames: The Iowa State University Press.

Gardner, B. (1972). "Minimum Wages and the Farm Labor Market." American Journal of Agricultural Economics, August: 473-476.

Hagenaars, A. and K. de Vos. (1988). "The Definition and Measurement of Poverty," Journal of Human Resources, 23 (3): 211-221.

Larson, O. F. (1968). "Migratory Agricultural Workers in Eastern Seaboard States." Rural Poverty in the United States. Washington, D.C.: U.S. Government Printing Office.

Lianos, T. (1972). "Impact of Minimum Wages Upon the Level and Composition of Agricultural Employment." American Journal of Agricultural Economics: 477-484.

Martin. P. R. Mines, and A. Diaz. (1985). "A Profile of California Farmworkers." California Agriculture: 16-18.

Pollack, S., et al. (1981). The Hired Farm Working Force. Washington, D.C.: U.S. Department of Agriculture, Economic Research Service.

Smith, L. W. and R. Coltrane. (1981). Hired Farmworkers: Background and Trends for the Eighties. Washington, D.C.: U.S. Department of Agriculture, Rural Development Research Report, No. 32.

Watts, H. (1967). "The Iso-Prop Index: An Approach to the Determination of Differential Poverty Income Thresholds." Journal of Human Resources, 2 (1):3-18.

White-Means, S. (1987). "Migrant Farmworker Earnings: A Human Capital Approach." The Review of Black Political Economy 15 (4): 21-33.

___. (1991). "The Economic Returns from Investments in Physical and Mental Health: A Case Study of Migrant Farmworkers in Rural New York," Journal of Health and Social Policy 2 (3): 39-51.

White-Means, S., P. Chi, and J. McClain. (1989). "Health Status and Economic Productivity of Migrant Farmworkers in Orange County, New York," Final Report to Milbank Memorial Foundation.

Whitener, L. A. (1985). "The Migrant Farm Work Force: Differences in Attachment to Farmwork." Rural Sociology 50:163-180.

Table 1. Poverty Status of Migrant Farmworkers and National Poverty Thresholds, 1986

Size of Family	U.S. Poverty Threshold	Migrant Farmworker Income (Means)	Deviations of National & Farmworker Incomes
1	$5,068	$5,813 (n=16)	745
2	6,493	6,350 (n=20)	-143
3	7,948	5,850 (n=30)	-2,098
4	10,191	7,274 (n=42)	-2,917
5	12,061	5,043 (n=35)	-7,018
6	13,633	5,230 (n=37)	-8,403
7	15,509	6,500 (n=15)	-9,009
8	17,094	5,214 (n=14)	-11,880
9+	20,465	4,260 (n=25)	-16,205

Table 2. Food/ Income Ratios

Size of Family	% With Monthly Food Expenditure Exceeding One-Third of Income
1	50
2	40
3	42
4	41
5	57
6	70
7	50
8	60
9+	57

Table 3. Escaping Poverty Via Human Capital Investment

Human Capital Measure	Poverty	Above Poverty	t (sig)
Years Formal Education	6.53	7.65	2.3402 (.02)
Years Worked in New York	5.56	6.05	0.6927 (.49)
Years in Farmwork	11.86	10.66	-.9171 (.36)
Years in Other Occupation	1.08	2.73	2.4637 (.01)
Age (Years)	32.67	34.00	0.9585 (.34)

Table 4. Poverty and Health Stock (% with health problems)

Health Stock Measure	Poverty	Above Poverty	Chi-square (sig.)
trouble climbing stairs? (0.41)	23.62	19.33	0.670
trouble bending/stooping?	18.11	17.65	0.009 (0.93)
trouble lifting heavy objects?	21.43	13.68	2.504 (0.11)
trouble standing?	19.69	19.33 (0.59)	1.073
trouble in the sun?	21.26	15.25	1.471 (0.23)

Table 5. Poverty and Access to Social Programs (% with program access)

Social Program	Poverty	Above Poverty	Chi-square (sig.)
Free/discounted food	40.16	34.78	3.479 (0.18)
Food stamps	49.11	42.72	0.882 (0.35)
Food commodities	34.09	22.7	82.598 (0.11)
WIC	20.47	17.65	0.418 (0.81)
Housing subsidy	8.66	7.56	0.638 (0.73)
AFDC	13.48	17.89	0.674 (0.41)
Unemployment insurance	31.50	34.45	0.469 (0.79)
Supplemental Security Income	3.15	3.36	0.904 (0.64)
Workman's Compensation	9.46	18.18	2.398 (0.12)

Table 6. Poverty and Farmwork Motivation

Motivation	Poverty	Above Poverty
	(% listing this item as their main motivation for migratory farmwork)	
No job	25.20	16.95
To make more money	34.13	47.46
Unemployed/laid off	19.84	11.86
No self-employed work	6.35	4.24
Enjoy traveling	6.30	6.78
Other economic reason	3.15	5.04
Other noneconomic reason	6.30	7.56

Table 7. Logistic Regression Estimates of Poverty Status

Variables	Coefficient	t (sig.)
Years in Farmwork	0.0313	1.91 (.09)
Years of Formal Education	-0.0841	-2.09 (.04)
Age	-0.0386	-2.22 (.03)
# Physical Limitations	0.1207	1.07 (.28)
Family Size	0.0762	1.70 (.09)
# Family Members Employed in Non-Farm Sector	-0.6870	-1.89 (.06)
Access to Type 1 Services[a]	-0.6897	-2.36 (.02)
Access to Type 2 Services[b]	0.6140	1.90 (.06)

[a] Type 1 public services are income subsidy programs.
[b] Type 2 public services are entitlements to particular food and housing services.

For copies contact:
Peter S. K. Chi
Department of Consumer Economics and Housing
Cornell University
134 Martha Van Rensselaer Hall
Ithaca, NY 14853

The Cornell Migrant Program is a joint effort of the College of Human Ecology, College of Agriculture and Life Sciences, and Cornell Cooperative Extension.

Cornell Cooperative Extension
Helping You Put Knowledge to Work

Cornell Cooperative Extension provides equal program and employment oppurtunities.

Printed on recycled paper